

Issue 4 June 2015

pyrotechnic MAGAZINE

FOR FIREWORK COMPANIES & ENTHUSIASTS ACROSS THE WORLD

A HISTORY OF

Plásticos Gamón

Plásticos Gamón's first pyrotechnic-oriented activities date all the way back to 1965. It was then that two brothers, Fernando and Manuel García Gamón, decided to create their own fireworks factory.

+ much more



Japanese Hanabi

Japanese Hanabi is essentially unbeatable in almost every imaginable way! OK, so maybe the Japanese rarely use massive salutes in their finales or shoot multi-break canister shells during their public displays, but outside of that they've reached near perfection.



The art of Girandolas

The Pennsylvania Organization of Recreational Chaos (PORC) is a club that likes to have fun. With that in mind, we always try to bring something unique and fun to the annual Pyrotechnics Guild International convention.



Chinese New Year 2015

Back in 2012, after we returned from our very first trip to China, we promised ourselves to return to Nanning again by 2015 to celebrate Chinese New Year. You see, we enjoyed our first trip so much, and we had such an amazing time.



Sonnwendfeier: The biggest display in Switzerland

Once every three years, in the quaint little mountainous city of Oensingen a 90-year-old tradition takes place. It is the biggest fireworks show in all of Switzerland occurs.

Welcome

The German's have a great word I just learned that that appears to apply to all artistic endeavors: Gesamtkunstwerk. Literally, the word Gesamtkunstwerk is used when you want to indicate that one art form just isn't enough. It is a combination of *gesamt* ("total") and *kunstwerk* ("work of art") and is used to describe an art piece that combines multiple mediums. What a perfect word to describe pyromusicals and pyrotechnics. Modern day displays certainly unite a myriad of artistic media, combining music, visual art, dramatic performances, sometimes dance and even projection. Fireworks displays today rarely rely on just one art form. To be robust and awe-inspiring, they must be a varied collaboration of creative art forms presented in unison. The word "Pyromusical" (which isn't even in any of my computer or printed dictionaries) just doesn't seem to do justice to the field of pyrotechnics and the master pyrotechnicians who put together these elaborate displays. Gesamtkunstwerk as a word seems much more apropos and appears to fit this massive field much better. Maybe this is what we should rename this hugely expanding, rapidly evolving field of pyrotechnics: Pyro-Gesamtkunstwerk.

Is it possible that Pyrotechnic Magazine is one year old already? Wow! One year! Woo-woo! And we're just getting started! In a cyberspace already overcrowded with magazines, ours has incredible

readership that just continues to grow by leaps and bounds. Whereas last May no one had ever heard of us, one year later and we have become THE pyrotechnic magazine that anyone and everyone who loves fireworks or is involved in the fireworks business is reading. Well, at least looking at the pictures and linked videos. Without resorting to actual testing, we can't be certain how much is being read. Are YOU reading the articles?

As usual, we have a very interesting edition of Pyrotechnic Magazine (issue #4) for you this month. We have an excellent article (and not just because I wrote it) about Jim Widmann and his amazing WASP machines. In it Jim quickly gets us up to speed regarding his current WASP Superstinger and his newest entry-level WASP Hornet. He has also recently imported 2½ metric tons of



a chemical most of us have never heard of (phenolic resin), but this simple chemical might be a game-changer for the U.S. shell production in the near future. Read the article to find out all about it, and then—particularly if you make your own shells—you might want to order 5 or 6 lbs. of the stuff.

Also in this issue is an article from our publisher about his Chinese New Year's trip to China. The good news is it is still a lot of fun to travel to China and shoot fireworks off there—especially during New Year's Eve festivities. The bad news that a lot has changed (and continues to change) in China, so it wasn't quite the awesome experience he had hoped and imagined. Read about what Tony Gemmink discovered on his most recent excursion there, and how China's societal and economic changes (and the rules relating to fireworks) will probably reverberate throughout the entire industry.

We have a wonderful interview given to us by Daniel Pérez Martín from PiroFan.com. Daniel interviewed Toni Gamón of Plásticos Gamón in Valencia and found out some very interesting information regarding the plastics industry in Spain and how polymers are

revolutionizing the fireworks industry there. They also have developed a new exquisitely ingenious contraption they call a “PyroLamas” which I’m certain will be a big hit with everyone putting together displays everywhere. It is a simple, light and inexpensive way to take control of pyrotechnic directionality. Read this article to find out more about it.



After I graduated from high school (please don’t ask me what year) I got to travel all around Italy for an entire summer and experience the incredible wonders of Italy. I loved the food, the people, the beauty of its incredible artwork and especially its coastline (the Italian Riviera is must to see!). Tobias Brevé and Robin Harteveld have provided us with a perfect glimpse of the wonders of Italian fireworks.



I know I was jealous to read about their trip there this past summer—all 9600 km of it—and I think you’ll be jealous, too, just imagining how great a trip they had. Read all about their phenomenal expedition, and see their photos and watch some great footage of beautiful Italian and Sicilian fireworks.

Speaking of Italian, do you know much about the language of beautiful Italian shells? Marcel Hanse and Leendert van Buren have sent us a great article—part two in their series—explaining Italian shells and their terminology (*terminologia Italiana*, of course). If you have always wanted to know what words like *rendini* mean, or *sbracatelle*, *lampi*, *pacca*, *colpicini*, *fuga*, etc., then be sure to read this informative treatise.

OK, I know we sing the praises of Malta in almost every issue, but honestly, it is well-deserved praise. I said it years ago when I edited ‘76 Pyro, too: “Malta is the fireworks capital of the world.” After all, what other little country do you know of that has 35 fireworks factories, along with deeply guarded shell design secrets passed down from generation to generation? Keith Buhagiar has provided us with an excellent glimpse of Malta in his article about Malta’s 14th Edition of the Malta International Fireworks Festival. Just when you thought you’d seen everything Maltese, the Maltese surprise you. Read this wonderful little piece and enjoy the photography that accompanies it. It was a definite reminder to me that I simply have to make it to this Mediterranean group of beautiful little islands before I die.

In this issue we take you from the sublime to the technical. If you’ve ever wondered about how to



calculate the risks involved when planning an elaborate pyrotechnic display, *Shellcalc*© has you covered. It is a sophisticated trajectory and fallout modeling program that makes it possible (probably for the very first time) to accurately calculate realistic safety distances, and take into consideration wind speed, wind direction, differing fire angles and a multitude of obscure details that you might not have thought would ever matter, but do. Best of all, this amazing program that considers things like “shell burst diameters,” “burn fallout” and includes several different graphical displays—is FREE! (At least the Standard version is free. The Pro edition is available by subscription). So, if you’re scientifically oriented, mathematically inclined, or are just planning a show in a location with limited space and need to know the trajectory of a 100mm shell fired at 15°, then this is the article to read—and program—for you.

We hope you enjoy this 4th issue, and be sure to email us and tell us what you think. We’re always looking for feedback on our issues, and we’d love to hear your suggestions regarding future articles.

Michael Richards
Editor, *Pyrotechnic Magazine*

pyrotechnic MAGAZINE

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There are many different approaches to scripting a Pyromusical and everyone has their own preferred approach. The external constraints of budget ultimately impose a maximum duration on the display of around eleven minutes and this drives the overall format since it is necessary to make it appear that it is rather longer than this...



50 **Japanese Hanabi**

Let me begin with this assertion: Japanese Hanabi is essentially unbeatable in almost every imaginable way! OK, so maybe the Japanese rarely use massive salutes in their finales or shoot multi-break canister shells during their public displays, but outside of that they've reached near perfection in almost every other aspect. To summarize, every Japanese Hanabi display you watch while in Japan...

60 Plásticos Gamón

When a company creates a new fireworks display, they generally attempt to do three things: fill the sky with color, engulf the surrounding air with intensive percussive sounds, and swathe the audience's olfactory system with the intoxicating sulfur scent of burning gunpowder. To accomplish this feat successfully takes many hours of hard work, and much more than just a passing love of fireworks...



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72 14th Malta IFF 2015

Malta has been manufacturing phenomenal fireworks for centuries, and regularly uses their astonishing shells in various celebrations throughout the year. Currently, there are over thirty-five fireworks factories located within this small island archipelago in the middle of the Mediterranean—all of which are dedicated year-round to the art of pyrotechnics. Although most firework factory workers do this job part time...

82 ShellCalc® Pro

Simply put, firework displays are not risk free. Because of this inescapable fact, it is vital that the risks are accurately and carefully assessed and managed to be as low as possible. To do so, assessments must be made using data regarding the conditions that may occur when the display will be fired. The process of managing the risks involves all parties: the event organizer, the event producer, the enforcing authorities and the firework contractor...

88 Widmann's Way: Sleek, Fast and Elegantly Designed

I realize that the word genius is frequently overused in today's highly inventive world, but in this case it is entirely apropos. And honestly, if you ever met Jim Widmann, you'd quickly ascertain he is a very humble guy who would probably blush to hear himself described this way...



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96 Chinese New Year 2015

Back in 2012, after we returned from our very first trip to China, we promised ourselves to return to Nanning again by 2015 to celebrate Chinese New Year. You see, we enjoyed our first trip so much, and we had such an amazing time, we simply had to go back. Great food, great people and over 80 shopping tents all around our hotel where you could buy almost anything your heart could desire...



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If you have an idea for an article, have any interesting fireworks photograph or have written an article that you would like to see in an upcoming issue of our magazine, please e-mail tony@pyrotechnicmagazine.com

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Ricardo Caballer, SA (Ricasa)

Ricasa, is a famous Spanish company specialising in manufacturing all types of fireworks. The company is at the forefront of research and implementation of new features and effects of all kinds fireworks.

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For further information about the products and services we provide please contact us using the details below.



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Sonnwendfeier 2015:

The biggest fireworks display in Switzerland

Written by Jack Suijkerbuijk & Photography by Gerdo Wenting

Once every three years, in the quaint little mountainous city of Oensingen, Switzerland, a 90-year-old tradition takes place. It is there that the biggest fireworks show in all of Switzerland occurs during the solstice celebration in March. Two clubs—Ravellen club (RCO) and the Vogelherdclub (VCO)—organize this popular event, and the fireworks are setup and fired on a picturesque hillside very close to the middle of the city. →

VCO



TO MAKE THIS INTO MORE OF A PYROTECHNIC COMPETITION, THERE ARE DUELING DISPLAYS PUT ON BY EACH OF THE ORGANIZING CLUBS, with fireworks from Ravellen set up on one side of the hillside, and Vogelherdclub's fireworks placed on the other. The centerline, or dividing line between the two clubs, is an impressive historic white castle called Schloss auf dem Hügel.

Actually, the fireworks aren't fired by either of the two clubs involved. They both hire some of the best pyrotechnic companies in Switzerland to do that for them. This year the Ravellen club hired Bugano www.bugano.ch **WEblink** to shoot their fireworks, and the Vogelherdclub hired →





Images of the storage set up and display sites. Also the 16" shell and large calibre tubes that were used in the display.



Sonnwendfeier 2015





Some of the amazing material that was used →

Hamberger Pyrotechnics
www.hamberger.ch **WEblink** to shoot theirs.

The most impressive thing about this festival—besides the incredible beauty of the surroundings and the talent involved in the pyrotechnic design and setup—is the amount of sheer firepower (or should I say “firepowder”) used during these displays. Approximately 10 tons of powder is lighted during the Sonnwendfeier festival,

along with almost 8000 mortars (the biggest mortar being 400mm\16-inches wide). Oh, and let’s not forget that the show itself lasts for about an hour and stretches out over several hundred meters until it reaches an amazing 1 kilometer long!

Of course, this kind of show costs money, and the budget for this extravaganza was estimated to be around 300,000 Euros! I’m sure the 50,000+ people who attend this →



The winding track of the display site in the hills



Sonn

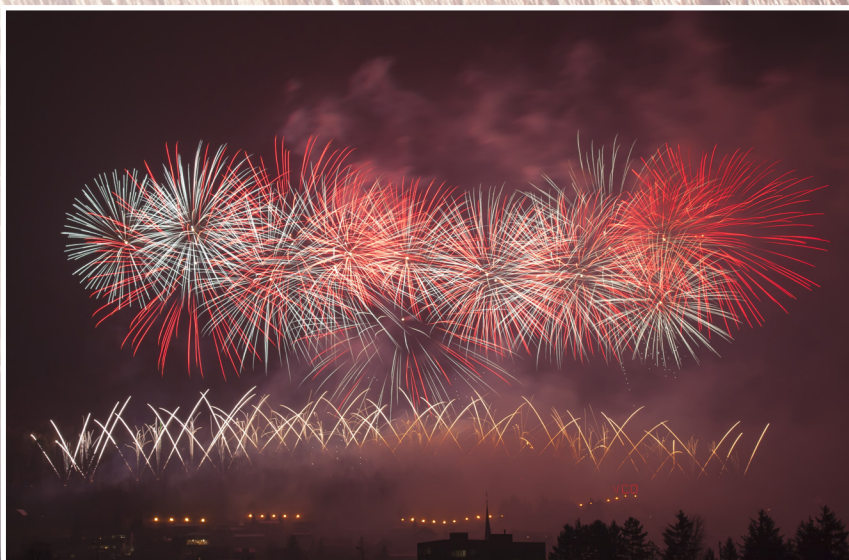


Wendfeier 2015





Sonnwendfeier 2015





triennial event from all across Switzerland and the rest of Europe considered the money well spent, however.

To complicate matters regarding the judging of this show (for me, anyway), the fireworks displays are divided into chapters, and each team is only allowed to fire one section of their show at a time—essentially taking turns with the other team. This certainly made it difficult to decide who I felt deserved to be crowned the winner of the 2015 Sonnwendfeier. The question was, which impressed me more: the clean way Bugano fired their displays, or the more passionate—and slightly more aggressive—way Hamberger fired theirs? You'll have to watch the videos to decide for yourself who the 2015 victor was. Both companies did an amazing job.

In keeping with their tradition, the next Sonnwendfeier will not be held until 2018. So, definitely make plans to be there on March 20th, and be sure to get there early! ■



Image of the 16"
shell used in the display.



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This month we have 5 new and exclusive T-Shirts to give away.

To have a chance of winning one of these T-Shirts all you have to do is look at the five aerial images pictured over this spread and work out where these pyro related place are in the world.

The information we need to know for each image is:

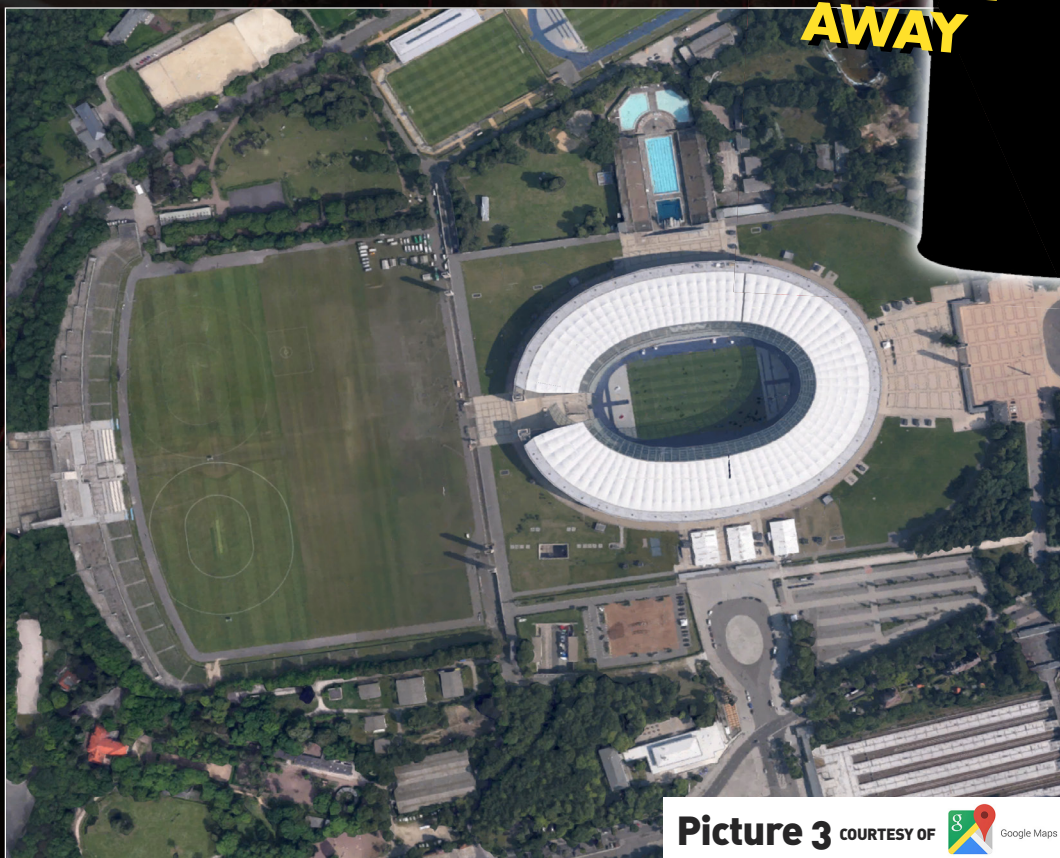
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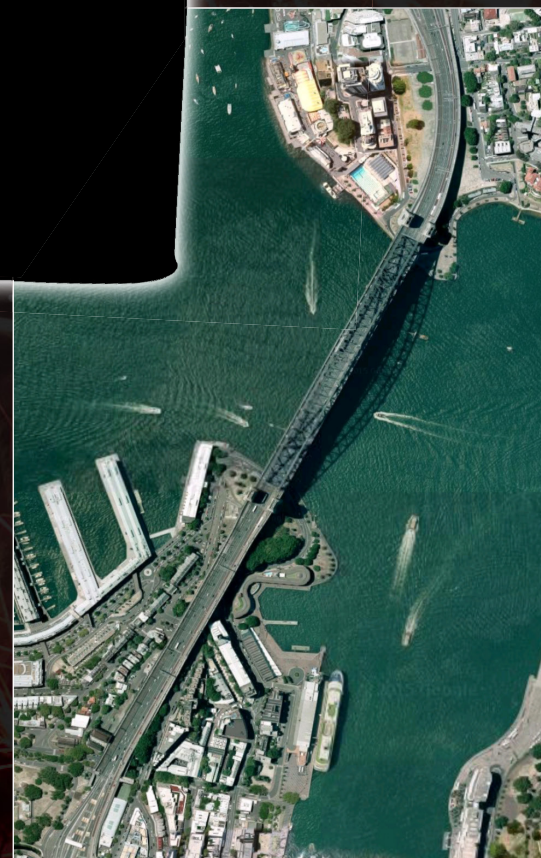
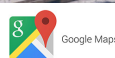
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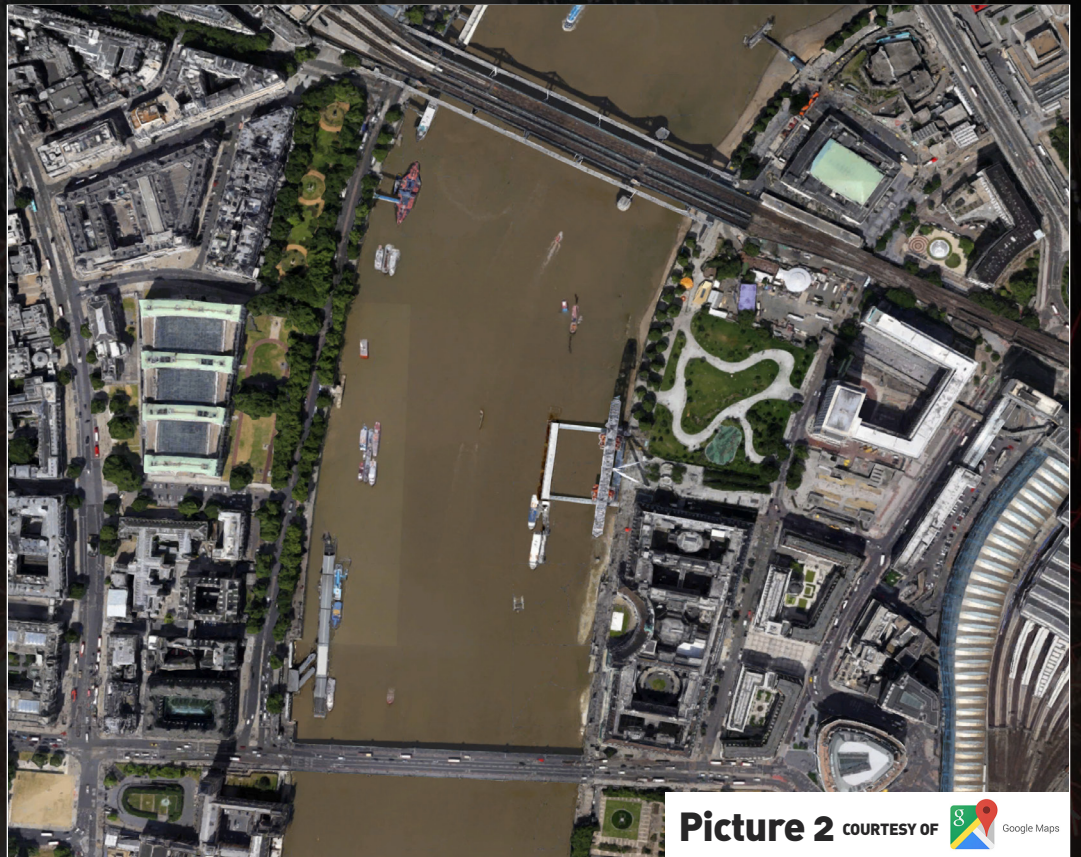


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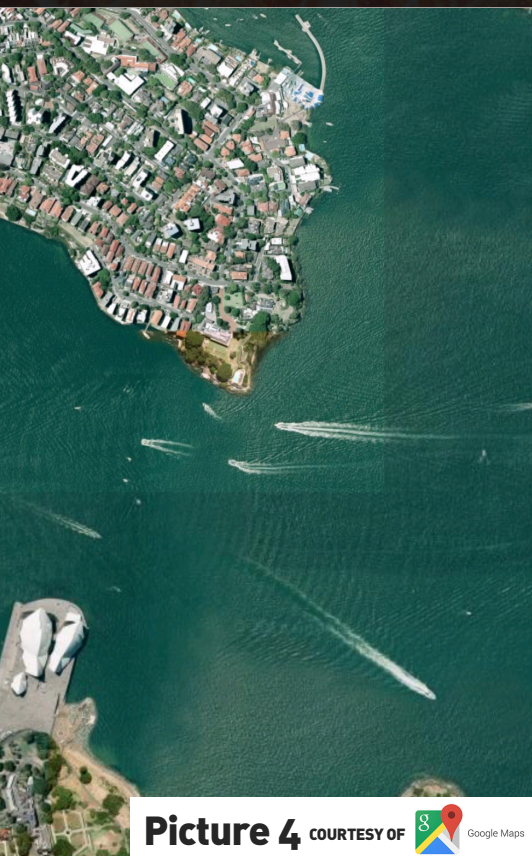




Picture 1 COURTESY OF  Google Maps



Picture 2 COURTESY OF  Google Maps



Picture 4 COURTESY OF  Google Maps



Picture 5 COURTESY OF  Google Maps

THE ART OF GIRANDO



P.©.R.C.

LAS

Written and photographed by P.O.R.C.

The Pennsylvania Organization of Recreational Chaos (PORC **WEblink**) is a club that likes to have fun. With that in mind, we always try to bring something unique and fun to the annual Pyrotechnics Guild International convention **WEblink**.



P.O.R.C.

Actually, we try to create something fun for each and every event we're involved in throughout the year. Cases in point: we made 1400 devices for the PORC show in 2013 **WEblink**, built a 14-foot-wide girandola in 2008 **WEblink**, built bouncing girandolas in both 2010 **WEblink** and 2011 **WEblink**, and lifted an 8-inch shell on a girandola in 2012 **WEblink**. We even flew a pumpkin in 2012! **WEblink** We also have a more serious pyrotechnic side and our technical prowess has made it possible to win a wide variety of awards since 2005 www.paorgrecchaos.org **WEblink**. It seems like every year, though, we at least talk about taking it easier—in other words, not making our usual 100+ girandola motors—but we never really take that kind of talk seriously and 2014 was busier than ever.

The original plan for the 2014 PGI convention in Mason City, Iowa was to bring two girandolas to honor two pyrotechnic colleagues who had passed earlier in the year—"Doc" Barr and Tony Petro. www.paorgrecchaos.org/tribute **WEblink**. Originally, we hadn't thought about bringing a daytime girandola, but a few weeks before the convention we changed our minds. You see, we had this cool idea about attaching a video recorder inside the girandola before it flew. So, we bought a GoPro camera and began experimenting by attaching the camera on the mount. We tried several techniques, and finally settled on mounting the GoPro onto a custom-made aluminum mount. Then we attached a bearing and a gyrostabilizer to the camera so it wouldn't spin the same speed as the frame. We



based it roughly on a model helicopter tail rotor. Here is one of our first tests: PGI 2014 - Girandola GoPro Test **WEblink**.

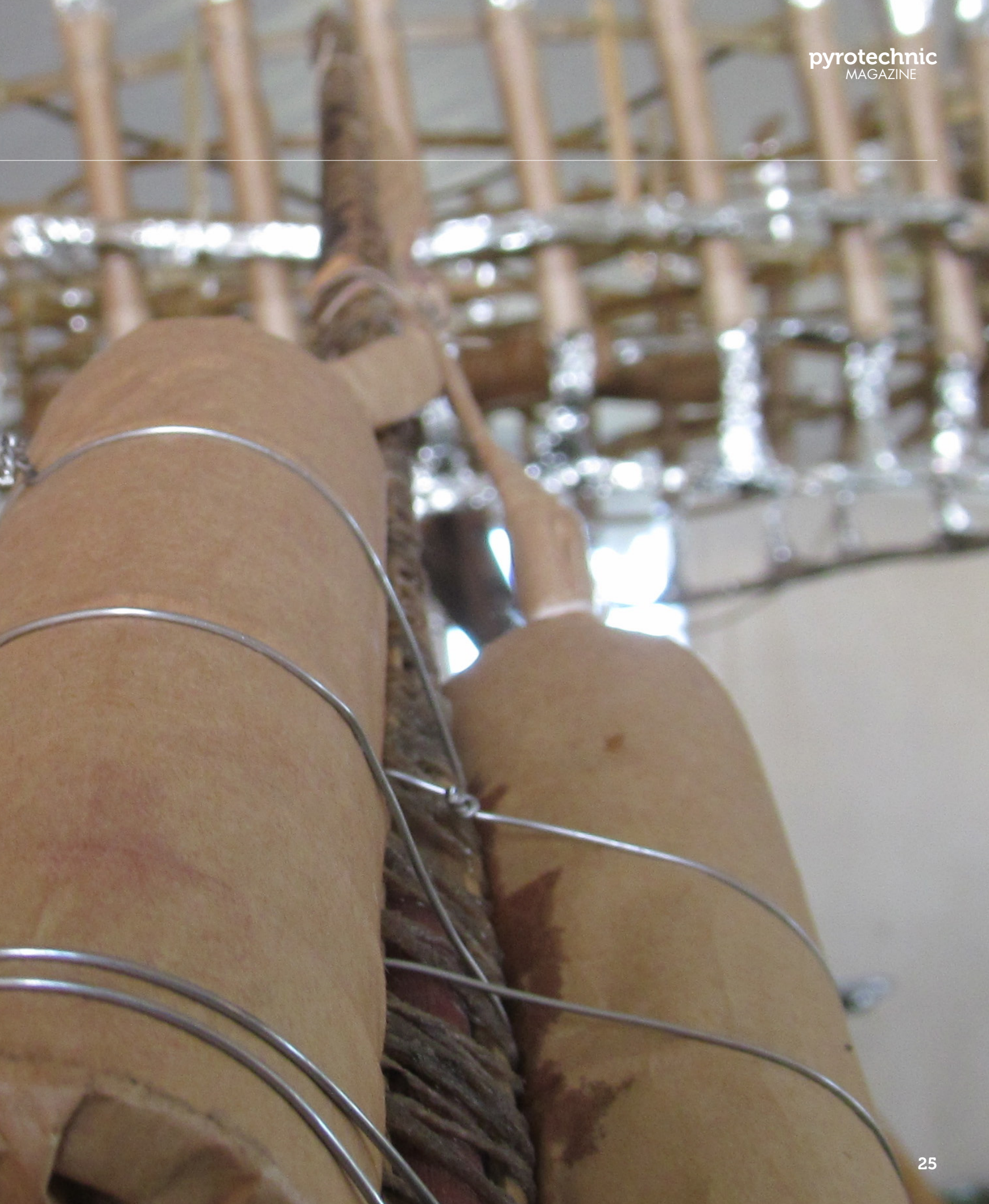
Obviously, we had to make several adjustments to keep the tail rotor spin at the correct speed so the camera would continually point in an acceptable direction. To accomplish this feat, we tried different sized rotors, and continued to make adjustments to the gyro and the remote control.

Since this was our first attempt to

actually fly a camera, we wanted to do it during the daytime to make it easier to find when the flight ended and the camera landed (gently, we hoped). Since The Gerry Gits Judges Challenge this year was themed "Deep Purple", we entered that particular contest and added purple smoke to the girandola. We also added a little orange smoke to contrast the purple.

The Girandola itself had a bamboo frame approximately 36" (91.5cm) in diameter, but when the arms were









P.©.R.C.

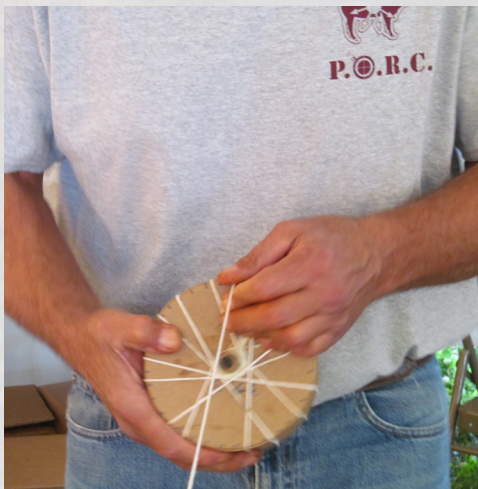
The good thing was that the girandole preformed flawlessly. Unfortunately, when the girandola landed, the entire camera mount popped off the frame. The camera casing snapped off, too, and the camera landed about 10 feet (3m) away from the frame. It took us a few minutes to find it, but we eventually located it nestled face down in the grass with the red recording light still blinking. Everyone breathed a collective sigh of relief when we saw the blinking light and that the camera—somewhat scuffed up and slightly damaged from the trip—was still working.

Here is our video showing some of the girandola's assembly and a couple of different views of the show. The voyage of the camera on the girandola begins at about 3 minutes and 31 seconds into the film. GoPro Girandolam [WEBlink](#) Overall, we were very pleased with how everything turned out. A lot of people didn't think it was possible or would work, but we think it did an excellent job for a first try. Now that we have proven our ability to stabilize a camera on a girandola, we hope to perfect our camera flights and try it again in the near future.

More pictures and video from this GoPro Girandola project can be found at here [WEBlink](#). Additional "behind the scenes" footage about this GoPro project will also be in the in the upcoming Passfire movie [WEBlink](#). ■



attached, it increased in size to about 12' (3.66m) wide. It took 30 one-pound drivers to lift everything off the ground. Both arms had two 1 1/4" x 6" (3.175cm x 15.24cm) tubes of purple smoke. As noted, we also added four orange smoke tubes inside of the frame. The headings were additional purple smoke inserts, whistles and reports.



Since we were shooting this in the Judges Challenge, it presented an opportunity to add additional effects to what we were now calling "The Purple PORC Performance." So we made a flight of rockets that had additional purple smoke, whistles and black smoke. Then we added several 6" (15.24cm) shells that would ignite black and purple smoke along with whistles and "boom boom kabooms" that we fired just prior to lighting the girandola.

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HIGHLIGHTS



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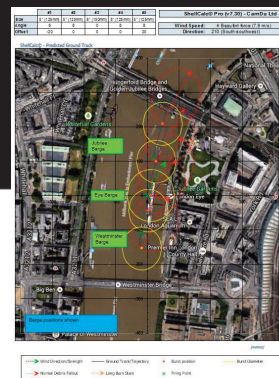
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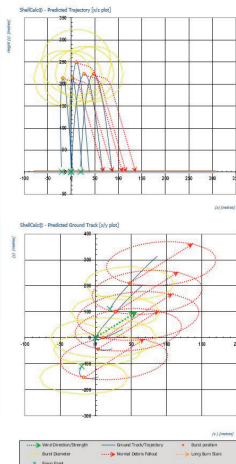
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OUR ITALIAN ROAD TRIP

Written and photographed by Tobias Brevé and Robin Harteveld

Our Italian/Sicilian road trip this year actually began in Cannes, Vive la France. We were fortunate enough to get to go the coast of France again to watch Festival d'ArtPyrotechnique de Cannes for the third time. Despite the fact the show was presented on the French Côte d'Azur (the French Riviera), it had a distinctive Italian flavor to it this year. That was probably because Alfredo Vaccalluzzo, the Italian master pyrotechnician created the display. →



ALFREDDO'S SHOOTING STYLE IS EXQUISITELY ELEGANT ALL BY ITSELF, but when accompanied by pulsating classical music from *Protectors of the Earth* by Nick Phoenix & Thomas Bergersen and *Aeternum* by James Dooley, the feel and intensity of the fireworks and music reaches an emotional peak. Of course, the high quality Italian fireworks provided by Vaccalluzzo Fireworks [pictured right] and used throughout the display certainly helped. The show wasn't perfect, but was close, and we thoroughly enjoyed its pageantry [see video below].



Since this was supposed to be an Italian/Sicilian road trip, for our next fireworks adventure we drove all the way down to the southern-most Italian village of Villa San Giovanni, through the picturesque province of Reggio, Calabria, and then took a short ferry trip across the Mediterranean channel to arrive in Messina, Sicily. Although the ferry ride was relatively short (and beautiful), it still took us about three more hours to finally reach our campsite.

To really understand the celebrations we came to see in both Italy and Sicily, it is important to understand that fireworks celebrations in the southern regions of these two areas are held for religious reasons, not to attract tourists. The fireworks are always comingled with their region's heart felt religious beliefs, and the intention of the celebration is to add dignity and solemnity to this distinctive part of their culture. A good example of this is the Festa di San Vincenzo Ferreri, which is celebrated in Calamonaci, →





Sicily. This is one of the largest annual celebrations held in all of Sicily, and its focus is to honor the Valencian Dominican friar San Vincenzo Ferrer (1350 AD-1419 AD). On the first Sunday of August, the Rigattiate is celebrated in his honor. The Rigattiate is often defined as a kind of holy war, due to its synthesis of faith and folklore, religion and paganism. Also during this festival, two important religious statues, Saint Michael, the Archangel, and St. John the Baptist, are carried in procession throughout the village. The festival culminates with two huge fireworks displays shot near the town, each one dedicated to either San Arcangelo Michele or San Giovanni Battista. Unique to these fireworks displays (and you'd have to be there like us to find this out) is there are so many festive activities taking place, that the fireworks displays don't even begin until a quarter past four in the morning!

In spite of it being 4:15 AM, the first show by Pirotecnica Calamita turned out to be well worth the wait. They especially impressed us by shooting off an amazing spherical 16" inch shell [pictured far right], which was probably the best we saw during our entire road trip. Another spectacular part of their show was their use of blinkers. Their white, blinking stars just seemed to go on and on forever! [pictured below].



Next up was La Rosa International Fireworks **WEblink** who began their display with a tour de force we never quite expected, especially given the early hour of the morning [pictured right]. Although their entire display was equally wonderful, there was a particularly special moment just

before the finale when La Rosa sent up a very large cylindrical shell. This exquisite shell consisted of 11 consecutive breaks (wow!) and it literally took our breath as we watched the 11 consecutive explosions that followed [pictured below]. Then, tired but



satisfied, we returned to our campsite sometime after 5:00 AM. It had been a very long night, but we had thoroughly enjoyed ourselves. [see videos below right]

Next, we took a ferry to the mainland of Italy and drove to the more centrally located Napoli (Naples). Naples is a very busy city that sits at the foot of Mt. Vesuvius (a stratovolcano about 9 km East of Naples) [pictured below]. What many



of you probably don't know is that Naples is also home to some of the best pyrotechnical →





craftsman in all of Italy. People like Luigi di Matteo, Gennaro Novellino and Guiseppe Catapano—dominant forces in most Italian fireworks competitions throughout the year. These men all live in Naples. We got to see them compete, too, during this road trip in Gragnano (on the outskirts of Naples), Montemarano (further inland) and Siano (on the other side of Mt. Vesuvius). Their four companies, and a fifth company, ZioPiro [WEBlink](#), that shot the opening display, but wasn't part of the competition itself, were all there. The unwritten criteria for the competition we saw had to do with sections involved: each display had to start with an apertura (literally an "opening"), include bomba da tiro (big multi-break cylindrical shells shot directly after the opening), have best fermata (best multi-break shell fired in the middle of the display) and end with a best finale. (A detailed description about "bomba da tiro" and other typical Italian fireworks can be found in an article written by Marcel Hanse and Leendert van Buren in issue 2 of Pyrotechnic Magazine on page 73).

Starting with the opening display, ZioPiro created a very powerful apertura with the kind of typical single-shot sequence their company is famous for [pictured below].



Their apertura was followed by a nice theme consisting of shells and matching candles. Additionally included (something Italian pyrotechnicians are also famous for) were wonderful multi-break cylindrical shells. These precisely timed multi-breaks literally made the show with their loud, rhythmical, pulsating thumping explosions.

This was immediately followed by an Italian finale, which consisted of smaller cylindrical shells and a colored heart surrounded by an ever-increasing number of reports embedded in a flurry of color which culminated in a massive BOOM at the end: [see video below right].

The contestants for this 2014 competition we watched were: Ditta Russo & Albano, Gerardo Scudo, Ruocco & Novellino and Guiseppe Catapano. All four of these competitors are well known throughout Italy for their precisely timed and powerful cylindrical shells. As described earlier, the displays had to begin with an apertura, followed by the bomba da tiro's, and the number of bomba da tiro's shot were determined ahead of time by the organizers of the festival. In Siano we got to see five bomba da tiro's shot by each company, so we witnessed a total of 20 Italian art pieces in just one evening! Guiseppe Catapano shot the fourth display that night, and did a very good job with it; his apertura was well timed and richly filled with quality Italian product. All of the bomba da tiro's were excellent as well [pictured right], especially the fifth one, and the finale was extra special because it began with a traditional multicolor shell that turned into a beautiful white rain. In our opinion (and obviously the judges agreed) Guiseppe Catapano was the clear winner of the competition: [see video below far right].

After a week and a half in Naples watching phenomenal competitions full of top quality product, it was now time to leave the coast and move northward. Our final planned destination for this trip was Montefiascone, about 33 km from Vallerano and close to a huge Italian lake called Lago di Bolsena. Vallerano is home to a wonderful fireworks festival hosted by Vaccalluzzo Events [WEBlink](#). Vaccalluzzo Events is another amazing company with an exceptional pyrotechnic history dating all of the way back to the 1800s, but that is an entire story by itself. This feast and festival, →





was planned to honor the saint San Vittore Matire, and was split up into a two-day affair. First, there was a celebration relying on batteria as its foundation, and second, a 30-minute spectacular display shot by Alessandro Vaccalluzzo.

To better understand what a batteria is, think of a daylight fireworks show shot in Spain using the mascleta. The batteria uses the elegance of a mascleta but intensifies it with sheer brutal force. The raw power of the Italian batteria is almost overwhelming to experience and listen to. The comparison might not be entirely fair, but Jos van der Veen mentions these two competing percussive displays in his article (published in issue #1 of Pyrotechnic Magazine [WEBlink](#)) "Mascleta to Batteria": "Regardless of how you compare them, and whether you say they are like figure skating to ice-hockey, or



Volleyball to Rugby, if you've ever experienced the batteria and mascleta, you'll know exactly why it's so hard to accurately compare the two." The difference might not be loudness, but raw intensity. For us, since it was our first time to witness and experience a batteria, we were quite impressed by its raw rhythm and the intense loudness the Italian flash powder created [pictured above and video right].

Since the next day would be our last show of this trip, we were excited that [main image on right and opening article spread image] the shooting area was loaded with a great many large caliber mortars,

including several 16" spherical shells! The fact we were going to be sitting pretty close to the shooting area itself made the prospect of huge caliber shells even more exiting. We were going to be so close, in fact, that even our 8mm wide-angle lens (which is capable of showing a 120° angle) would not be wide enough [pictured right inset].

As we had hoped, we were impressed with this final show from the beginning to the very end. The end in particular was incredible because of its double finale! Unfortunately, due to a camera malfunction we didn't get video of the show, but the friends we made in Italy gave us permission to use video shot by Claudio Massimino: [video far right bottom].

Sadly, our trip came to an end and we had to drive home. It was certainly a road trip we would never forget. All total, we drove over 9600 kilometers (5,695 miles) and did it almost entirely in just the country of Italy. During that time we witnessed over 40 wonderful displays, took some great photos and video, and made friends in every place we stayed. Yes, Italy is great for fireworks, but it is also rich in culture, beauty, food and friendliness. So, we've already decided to take another trip there this year! Now that we have a thorough understanding of "the Italian way", and Italian friends all over to point us toward the best places to visit and watch fireworks, our next trip might be even better. ■





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PYROMUSICAL

Scripting

Written by Paul Marriott & Photography by Simon Turcotte-Langevin and Paul Marriott

There are many different approaches to scripting a Pyromusical and everyone has their own preferred approach. The external constraints of budget ultimately impose a maximum duration on the display of around eleven minutes and this drives the overall format since it is necessary to make it appear that it is rather longer than this. Knowing this in advance helps shape the music and I normally strive for six or seven thematic elements to comprise the soundtrack in order to provide the appropriate emotional journey for the audience. →

PYROMUSICAL *Scripting*

FOR THE PAST TWO YEARS I'VE WORKED WITH LOCAL MONTREAL ELECTRO-ACOUSTIC COMPOSER SEBASTIEN LAVOIE. Our first collaboration was an entirely original composition entitled Pyro PowWow, see video below



and the second was more of a classic Pyromusical comprised of existing music entitled Odyssey of Fire, see video below.



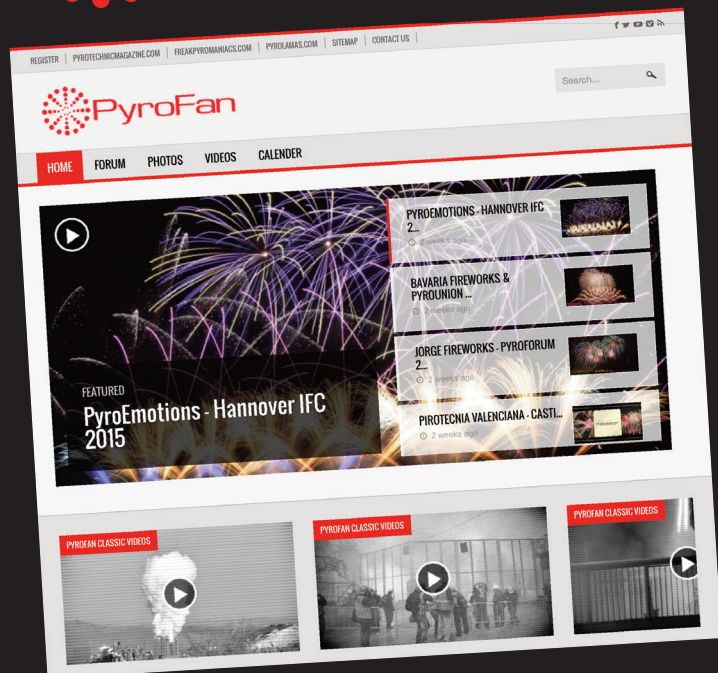
I believe it is interesting to contrast the two as a somewhat different approach was used in each case, especially in the use of technology.

Before even considering the musical aspects, it is important to get the pyrotechnic staging correct and so my initial starting point is always the physical layout of the firing site. Having witnessed so many Pyromusicals in the Montreal competition, I favour a multi-ramp approach in order to use as much of the sky, at all levels, as possible. This leads to three positions at the "back" for shells of 75mm and above, see image below, five



positions for cakes, Roman candles and 50mm shells, see image on first spread, and five front positions for smaller effects. Occasionally a few extra positions, even closer to the audience, may be brought into play for set pieces etc. This layout ensures that all possible angles can be used and provides the essential interplay between the lower-level effects and the shells above. The left and rightmost shell positions, for example, are angled at ten degrees to the left and right respectively, see image below, →





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A HISTORY OF Plásticos Gamón
Plásticos Gamón, first pyrotechnic company in the world, has been producing fireworks since 1880. It is now a family business, but still maintains its tradition of excellence.

Japanese Hanabi
The Japanese Hanabi festival is a celebration of fireworks. It is a tradition that has been passed down for centuries. The festival is held in various parts of Japan, and it is a time when the whole country celebrates.

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to give the maximum spread in the sky and allow a contrast between them and the centre position. Five positions for candles and one-shots gives enough possibilities to create interesting patterns and overlapping effects.

The second constraint I keep in mind is the physical characteristic of the firing racks. For example, 125mm racks two tubes, 100mm racks usually have five tubes available and 75mm racks have ten, see image below.



Budget and practicality preclude using individual ematches for all the shells so a mixed approach is used. Key accent points get individual cues, but most of the shell sequences are constructed with pyrotechnic time delays. Thus a rack of 100mm shells could form a sequence of fifteen or twenty seconds if three second or four second delays are used. Similarly for cakes, these usually have a duration in multiples of fifteen or twenty seconds. Knowing these physical constraints in advance helps shape the design of the soundtrack.

A third constraint I try to apply is a simple one: don't use the same effect twice in a display. Every thematic element of the display should have its own musical and visual distinction. In reality, this is often easier said than done, though, the

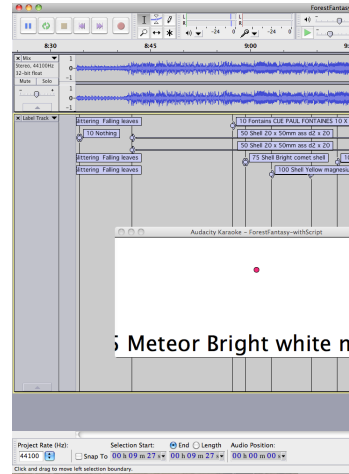
time constraint on the display actually helps here as a display of ten to fifteen minutes may be imposed by the budget.

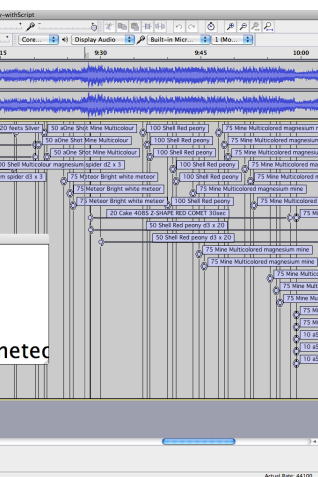
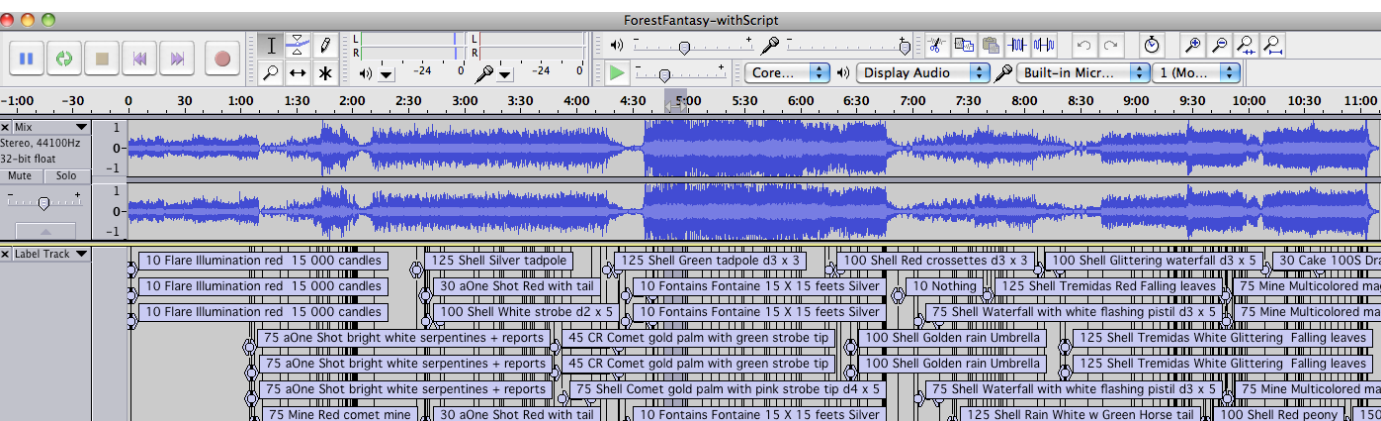
Fortunately, there are very many fireworks effects so it is usually not too onerous to achieve this, though in displays over twenty minutes it is much more difficult. Working with the award-winning Royal Pyrotechnie of Ste Pie, Quebec, helps here as they produce many large pyromusicals and so have a very broad inventory.

With these three physical constraints in mind, the design process can begin. I usually begin with the soundtrack as this is the backbone of the pyromusical, though for the project where Sebastien specially composed the music, a more mixed approach was used.

These days there is software available that allows an entire Pyromusical to be visualized using a simulation of the actual pyrotechnic effects and the firing positions used. Examples of such software are Finale Fireworks or VisualShowDirector. For the displays I design, we use the Pyrodigital firing system and, ultimately ShowDirector is used to enter the final script, irrespective of the way the initial design is performed. In order to edit the final audio track, we used Audacity, though Sebastien has many pieces of special software at his disposal for the composition and mixing process.

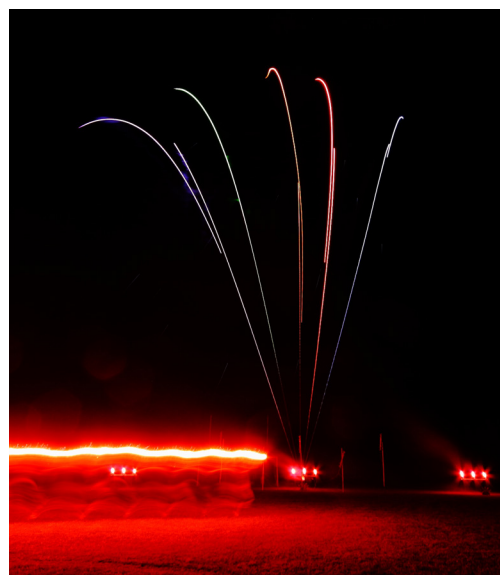
Audacity has some useful features that are helpful when designing a pyromusical. One that I particularly like is that ability to add text labels to the soundtrack. This sounds rather uninteresting, but some simple transformations in Excel allow the creation of start and end times for particular effects and these can be seen when annotated onto the audio waveform. ShowDirector can export an Excel file of the script and I used this for final verification and tweaking of the display. For example, a cake may last 30 seconds or a sequence of 5 shells with a time delay of 3 seconds between each will last 15 seconds. It can be difficult to visualize which pyrotechnic elements are





firing simultaneously, but the addition of these labels in Audacity make it very easy to see, see image above. Even more fun is the Karaoke mode that Audacity has – this will “fire” each label with a red bouncing dot as it is encountered during the playing of the soundtrack, see image left. Of course, just the overall envelope of the soundtrack as displayed can be used to verify the energy levels throughout the display. In the examples shown, there are seven songs in the final soundtrack.

One thing I also like to do in my displays is, where possible, create a “live” part for myself to participate in fireworks. The scope of this is usually restricted to running with gerbs or flares, but it is always fun. I have seen displays where performers play live and have pyrotechnic effects triggered by their playing – this is a dream that budgetary restrictions have not allowed to be realized yet. In one display centered around an Olympics theme, I was required to run in front of a set of five wheels representing the famous rings logo and appear to light them with a flare (though their ignition was, of course, controlled by the Pyrodigital Field Controller). A long exposure photograph has me appearing as a ghostly figure, see image below, just prior to the rings’ ignition.



Some designers like to use the visualization software for the entire process, but I have found that it can be too time-consuming. For the Pyro PowWow project, I did use Finale Fireworks to visualize parts of the display, in order to better work with Sebastien on the compositional side. The entire process was quite long as it took around six months from inception to completion, during which time Sebastien was already working on a Masters’ project on the same musical theme. Being able to visualize some of the effects helped Sebastien. For the Odyssey of Fire project, we started with the soundtrack and a target display length. I recently interviewed Sebastien to talk about the approaches we used on the two projects, listen to the interview here [WEBlink](#).

These projects were completely different to normal process of composition. For PowWow, it was a brainstorming around the theme of using Native music. The intent was to try to make the musical theme up-front and centre but to also create a musical evolution as well as create climatic build-up for the final.

For the Odyssey of Fire project, it was more like a classic playlist process of choosing relevant songs for the theme that would be musically interesting to both of us. We had a bank of interesting music in mind and then went from that using a perspective of requiring a certain flow, with ups and downs in the energy and dynamics. It’s not always obvious how to come up with this flow and dynamic but the project becomes much more organic if you can get the energy levels correct as well as have the right build-ups for the audience.

There are two schools of thought as to how a soundtrack should be constructed and these are whether to have gaps →



PYROMUSICAL
Scripting

between the pieces of music or not. I prefer, where possible, to have seamless transition between pieces, though this doesn't always work. For Sebastien this was a welcome challenge for the Odyssey project as he said that's how a composer shows he has musical knowledge and can use this to keep the audience interested if the segues are done in an artistic way, without losing the audience. It's both an interesting and creative challenge as he can show his knowledge of the music as much of the music is already known to the audience. The skill, then, is to bring the different stories together from the elements of the pieces of music as they transition from one to the other.

One technical challenge is that it's difficult to make the transitions sound seamless due to differences in pitch and tempo. I asked Sebastien how he dealt with this and his answer was interesting. As he started music late in life he said he doesn't have a traditional understanding of pitch, but does have an innate sense of what sounds good, without a clear understanding

as to why and so lets his ears dictate what works for both pitch and tempo. There are also tools available that can help with this to identify the pitch of a song or change its tempo without affecting the pitch, but these weren't required on the Odyssey project.

I had mentioned to Sebastien to think in terms of fixed time constraints, such as intervals of 15, 20 and 30 seconds as these correspond well to many pyrotechnic effects. However, he told me that had forgotten about these and so it was the music which really dictated what was required as this led to more fluid transitions. When I have done soundtracks on my own, I've always tried to take into account these time intervals, but it is not easy to do without creating un-natural sounding transitions between pieces.

If asked if the representation of the music by the fireworks really respected his musical choices and so I was happy to hear that Sebastien was very pleased, especially when he re-watched the displays afterwards. For the Odyssey project we had decided to use girandolas at one key point but they were somewhat lost in the smoke, though. I pointed out that it is sometimes dangerous to rely too much on these extra special effects, just in case they don't work as planned and so it's always good to ensure there is still some action taking place at that moment. The audience won't usually know there was something special planned then, if it does fail.

Finally, Sebastien said that each time he has worked on these projects he has been overwhelmed as these are a dream come true.

I must give sincere acknowledgements to Yanick Roy and Patrice Guy of Royal Pyrotechnie who turn my designs into the final product for public display. Without their support and encouragement, and the crew of excellent pyrotechnicians to set up the displays on the day, none of this would have been possible. ■

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Japanese Hanabi

Written by and photography by Toby Isler (1PYRO8)

Let me begin with this assertion: Japanese Hanabi is essentially unbeatable in almost every imaginable way! OK, so maybe the Japanese rarely use massive salutes in their finales or shoot multi-break canister shells during their public displays, but outside of that they've reached near perfection in almost every other aspect. →

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Japanese Hanabi

TO SUMMARIZE, EVERY JAPANESE HANABI DISPLAY YOU WATCH WHILE IN JAPAN (HANABI IS THE JAPANESE WORD FOR FIREWORKS, BY THE WAY) will assuredly create a myriad of perfect shapes, fill the nighttime sky with crisp, vivid colors, and contain innumerable assortments of complicated effects.

Summertime means Hanabi time in Japan, and there are literally hundreds of Hanabi festivals celebrated throughout the country and viewed by hundreds of thousands of enthusiastic Hanabi fans. They are so popular, in fact that some festivals are sold out months in advance! (Keep that in mind if you plan to journey there to see one).





Stunning images by Toby Isler (1PYRO8) of the Japanese Hanabi festival shows throughout the country every year. These photographs were taken at Nagaoka, Nomura.



Above: Material at its best from one of the best Japanese companies, Nomura! Captured during the Nagaoka fireworks festival 2014.



Above: 3x600mm + wide music starmine with a lot of singleshots. Akagawa fireworks festival.



Above: Music starmine with an awesome shell at the end. Akagawa fireworks festival 2014.



Japanese Hanabi

Yes, the Japanese love to celebrate almost any occasion with fireworks. Over time, it has become totally engrained in their culture. A typical Hanabi festival in Japan means good food and drink and huge crowds.

A quintessential Japanese Hanabi festival agenda will include:

1. (Music) Called "starmine" instead of being called a display, pyromusical or show.
2. A "wide starmine" might be a display several hundred meters wide. Look at the photo/video from the "Phoenix 10" super-wide starmine at Nagoaka on the next spread.
3. Competition (focused almost entirely on quality shells). This is perhaps the most popular aspect of the Hanabi festival. Generally, several companies compete in this by exhibiting their creativity and pyrotechnic skill for the both the judges and audience.



Japanese

Hanabi



Above: Super wide starmine, called Phoenix 10 during the Nagaoka fireworks festival 2014

If you do decide to travel to Japan, you're in for a real treat. Fireworks aside, Japan is simply a wonderfully beautiful country to travel in. I can personally vouch for their railway system as well (I especially liked the the "Japan Rail Pass" for tourists!). Japan has an amazing history, high-tech equipment everywhere, phenomenal food and—last but not least—extremely friendly people who love fireworks! ■



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Plásticos Gamón

Written by Daniel Pérez Martín Website: PiroFan.com [WEblink](#)

When a company creates a new fireworks display, they generally attempt to do three things: fill the sky with color, engulf the surrounding air with intensive percussive sounds, and swathe the audience's olfactory system with the intoxicating sulfur scent of burning gunpowder. To accomplish this feat successfully takes many hours of hard work, and much more than just a passing love of fireworks. Skill and creativity are equally important to pyrotechnic productions. Most companies specialize, however. There are companies who create the colorful fireworks themselves, and then there are companies who specialize specifically in turning fireworks into massively creative pyromusical productions. One such company is Plásticos Gamón www.gamon.es [WEblink](#) located in Valencia, Spain. Plásticos Gamón is internationally known, and by design is centrally located in one of the most fireworks savvy cities in the world. →

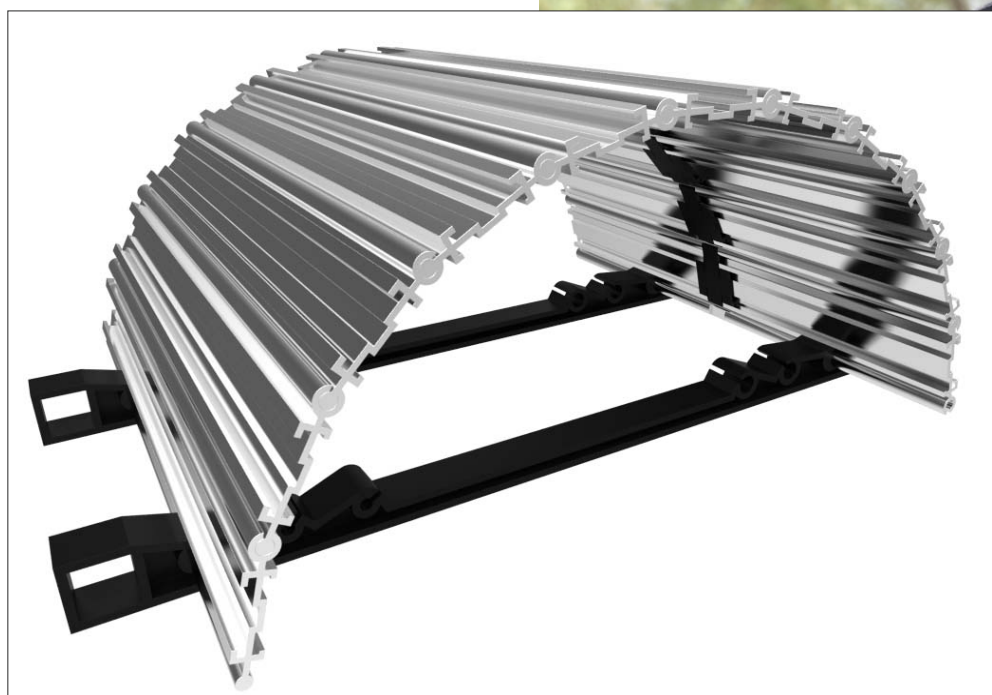


PiroFan.com WEblink brings fascinating pyrotechnics news, stories and information (available in 8 different languages!) to anyone interested in the world of fireworks. It contains actual news with photos and videos about fireworks shows and competitions in Spain. On special events, such as the "Fallas de Valencia", the site produces extensive and exclusive articles.

A Brief History of Plásticos Gamón

Plásticos Gamon's first pyrotechnic-oriented activities date all the way back to 1965. It was then that two brothers, Fernando and Manuel García Gamón, decided to create their own fireworks factory. Given its prime fireworks location in Valencia, many of the most prestigious Valencian pyrotechnic companies in Spain became their first customers. Actually, many of their innovative products and designs—especially their usage of plastics and product safety enhancements—have truly revolutionized the fireworks industry worldwide, so their success has been mutually beneficial. Today, a 2nd second generation has taken over the helm, and although they are not brothers like the company's founders, they are still family: cousins Antonio M. García-Gamón Valero (aka "Toni" Gamón) and Fernando García-Gamón Antón. Together, they now lead Plásticos Gamon, and they have carefully molded their company into one of the world's leading pyrotechnic distributors.

Toni Gamón, the manager of Plásticos Gamón, provided us with a few interesting historical tidbits you will probably never read in any other publication. You see, Plásticos in Spanish means "plastics." And his company—which would have been called Gamón Plastics anywhere else—originally made plastic parts for industrial use and also for assorted toy companies. Given their location in Burjassot (essentially a suburb of Valencia), however, and because of his father's and uncle's close friendship's with the Brunchú and Caballer families, coupled with a great love of pyrotechnics, they came up with the idea of creating a rocket head using a candy baby bottle they already manufactured. Substituting the candies inside with powder stars, this first success led to many other ideas and innovations. As their design talents emerged, their design collaborations



progressed into making salutes and a variety of shell casings.

Toni Gamón interview with Daniel Pérez Martín:

Q The early life of any company is always complicated. We assume that being in such a traditional fireworks area like Valencia helped Plásticos Gamón consolidate. How readily did the other fireworks manufacturers accept your company when it began constructing pyrotechnics?

A Well, fortunately, we were successful from the start. That didn't mean we didn't have to do extensive testing, we did—especially before placing new products on the market. Our plastic parts had two major factors that made them somewhat revolutionary at the time: they were waterproof and also uniform in size. That made it possible to increase manufacturing capacity, and perhaps more importantly, made them safer to manufacture and to store. Of course, working closely with local pyrotechnicians, and soliciting their advice made a huge difference. Their willingness to allow us to →





use their facilities for the various tests helped us a great deal, too, and made it possible for us to offer a wider range of products much faster than we would have been able to without their help. It certainly didn't hurt that Valencia is the capital of pyrotechnics in Spain. Coming from Valencia and being used by important display companies brought us immediate credibility and created considerable demand for our products.

Q Unlike before, polymers now seem to be almost everywhere. In a sense, compared to their cardboard and paper cousins, plastics have revolutionized in the European industry. How do using polymers like yours change the pyrotechnic game? What are the advantages—and/or disadvantages—of using plastic over traditional materials?

A As we all know, there are countless conveniences and advantages that polymers have brought to our daily lives. The list of plastic products and parts we use and manufacture are almost limitless. So, it was only a matter of time before we applied some of those techniques to the field of pyrotechnics. From our perspective, plastics provide important properties that have been lacking in many past products: uniformity, compactness, boltless construction and total water/inclement weather resistance. Another added benefit is they are lighter in weight and stronger. In addition, chemistry and the field of polymers are constantly evolving, and new materials open up many new possibilities and make new products possible.

Q When did you first decide to sell your products abroad, outside Spain? And do you have any competitors doing the same thing?

A In a sense, we've considered the export market to be our third market, with Valencia first, Spain second, and the rest of world coming third. Following



that natural progression, that is just how sales our progressed. Usually a company would come to Valencia, buy some of our product, then other companies would hear about it or see it and place orders of their own; eventually companies outside of Spain started hearing about our products and doing the same thing. It helped that our parts were being used in other factories as well. Now, we have an international reputation. When we travel to sell products worldwide participating in fairs or international symposia (like the ISF or the American Congress APA) everyone seems to know about our company and many of our products. As for competitors, there isn't much competition. Most of our products are patented and we invest a great deal financially to develop new products every year. Our catalog now includes over 400 active and 600 referenced products in total, including molds for each. Still, there are companies that produce some parts, but none that we know of exclusively making fireworks like we do. We believe our in-depth knowledge of pyrotechnics is essential when we develop new products, and that is one of the reasons our products are so successful.

Q What types of plastic do you use in your products at Plásticos Gamón?

A In the beginning we used three basic types: polystyrene, polyethylene and polypropylene. At present, most of the mixtures we use are either prepared by us or we hire other manufacturers to combine different raw material grades for us exclusively. The evolution of the different

raw materials has been extraordinary in recent years and the possibilities are almost infinite. Currently, there are a vast number of polymers on the market, each one with different properties, and it is our goal and intention to find the right use for each of these types.

Q In your catalog there are over 500 basic fireworks products and accessories listed. Do you make all of those products to order, or do you create all of them and keep them in stock and store them?

A Actually, we try to do both. There are certain products that we produce larger quantities of and store to ensure their availability when they are in high demand. Other products we also produce ahead of time to keep minimum stocks available. Some products, however, have to be made to order. Your have to realize, the fireworks market can change rapidly, and new regulations sometimes force us to modify some of our designs. If we had large quantities of everything, some of our products wouldn't be up to code and would be obsolete.

Q Now that we're in the 21st century and ecological awareness has finally reached a conscious level—especially regarding plastics—are you working with biodegradable polymers, and are you purposefully altering any of your designs to minimize waste or improve their decay time?

A Plásticos Gamón is greatly concerned about the environment. We have been using a percentage of recycled raw plastics in our products for many years now. Recycled plastics that are used in other products (sometimes for a second or third time) don't fill up the landfills. We also have a complete line of parts made of strictly biodegradable materials. That takes time and effort to introduce, but market demand for biodegradables is increasing all the time. →



“We have been competing with Asia in the fireworks market now for over 20 years. Overall, their impact follows economic cycles, and their effects are variable.”

Change is definitely happening, but changing all of our products too quickly is impractical. In addition to what I've already described, however, we also have a line of mixed material cases (made of both cardboard and plastic) that are comprised of 90% organic material but retain the plastic properties that make them safer.

Q Innovation and research and development are critically important to most successful companies when it comes to developing new products. What kind of research does your company depend on and how does it generate creative ideas for new products?

A We are very proud of what we call the "Gamonets"—a colloquial name our customers have given to our 50mm 9-shot base. It's a rack of 9 50mm mortars that sits on one piece that can be ignited at the bottom. It was a difficult proposition for us and involved a very large financial investment to make the mold, but the product has been very successful and we

adopted the usage of the "Gamonet" name for an entire new line of products based on that design. Currently we sell 5 different types of Gamonets. They all have compact bases and include a different number of mortars that are connected at the bottom. One added benefit (and a very ecologically sound principal you don't see built into any other mortar products) is they are reusable, and when they are eventually worn out, the customer can return them and we'll clean and grind the plastic and make them into other plastic parts.

Q If you can tell us without giving away any secrets, what exciting new products are your R&D department currently developing?

A We currently have two products under development. One is a new system we call PyroLamas that we just released to the market. We are very proud of this "all in one solution" because it represents an entirely new way of setting up fireworks for display. This is a revolutionary

concept because it is flexible, alterable and makes formerly impossible shooting patterns, possible. At the same time, we are preparing a 2nd generation of single shot tubes (mono tiros), we developed over 10 years ago and we think our new approach will change the way much of pyrotechnic firing is done worldwide.

Q Can you provide more details to us about your new PyroLamas system? What is so new about this system and how does it compare to other systems already on the market?

A PyroLamas is a very exciting new system that we developed to do several important things: simplify the assembly of mono tiros (single shot tubes) for small and medium sized fireworks. You see, for many years, pyrotechnicians have had to buy an assortment of expensive platforms and devices to create arcs and other effects as part of their displays. Each of these frames were singular, fixed, and did not allow much (if any) alteration of the configuration or change of caliber. But professionals spent a great deal of money on these fixed devices anyway to create the huge arcs they visualized. These devices were expensive, heavy and most were difficult to transport and store. Plásticos Gamón decided to develop an alternative method that could solve all these problems at once. That idea became the PyroLamas. This is a scalable system made of all aluminum parts, with various configurations possible using only two or three different sections. It is lightweight, easy to store, versatile and relatively inexpensive. Now, for the first time, your imagination can now rule how you set up your pyrotechnics. It has innumerable configurations and even those configurations can be altered quickly onsite if something unexpected occurs. The PyroLamas has only three basic working parts, and we've added a few accessories that make it into a truly global system. Think of it as an adjustable directional firing →





“There are certain products that we produce larger quantities of and store to ensure their availability when they are in high demand. Other products we also produce ahead of time to keep minimum stocks available.”



system that gives you directional firing capabilities you never had before. And best of all—they are available right now. We currently have distributors in Germany, The Netherlands, England, Portugal and Canada.

Q As a European manufacturer of many necessary pyrotechnic parts for the fireworks industry, have you noticed a crisis affecting the fireworks industry here? Is there still a commitment by European companies to domestically manufacture fireworks or are we destined to see "Made in China" stamped on most of the products we buy?

A We have been competing with Asia in the fireworks market now for over 20 years. Overall, their impact follows economic cycles, and their effects are variable. The problem is not competition, the problem is a lack of awareness by authorities that don't seem to grasp that a boost in domestic production generates wealth and employment. Also, the consumer has to understand that the

European products tend to be safer and better regulated than their Chinese counterparts. What you are calling a "crisis" is really a multifaceted problem. But it definitely has impacted manufacturers, import companies and retailers. Facets such as a lack of demand, taxes, storage costs, regulatory costs, licenses, etc., can be extremely prohibitive for struggling companies.

Q In what your doing are you also a pyro hobbyist, or is this just a job for you?

A Not only do I love fireworks, but my entire family loves fireworks as well. Now that our company is bringing in its 3rd generation, we are trying to instill in our children the love and respect for pyrotechnics and its traditions that we have. Spain is a leader in pyrotechnics for many reasons. One of the reasons is due to its will to preserve their historical traditions. Fireworks might help us put food on the table, it's true, but their beauty and artistic intensity also feeds our souls.

Q Do you have any interesting stories that might interest our readers?

A I have many anecdotes. In our business, unusual things—sometimes funny—happen all of the time. I still remember a client who sent me some very complicated drawings for a piece that would have required a very expensive mold to produce. We wound up sending him to a hardware store where he could buy the same thing he was asking us to build, for very little money. The important thing is to meet the needs of our customers, not just sell them products. We also have a Greek friend who has our logo "Gamonet" tattooed on his shoulder! He did it because he felt the product faithfully represented all pyrotechnicians. On the one hand, that may seem unusual, on the other hand, that is the kind of respect our company strives to earn. ■

You can visit Plásticos Gamón website here www.gamon.es **WEblink**



Ricardo Caballer, SA (Ricasa)

Ricasa, is a famous Spanish company specialising in manufacturing all types of fireworks. The company is at the forefront of research and implementation of new features and effects of all kinds fireworks.

The company maintains and constantly increases its prestige and international recognition for the quality of its products and commercial reliability, being holder of certificate ISO 9001:2000 in the Design, Manufacture and Marketing of pyrotechnic material.



For further information about the products and services we provide please contact us using the details below.



Pirotecnia Ricardo Caballer S.A.
Partida del Arenal, s/n
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Video 2



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DISPLAY ON 25 APRIL**

14th Malta IFF 2015

(INTERNATIONAL FIREWORKS FESTIVAL)

Written and Photographed by Keith Buhagiar

Malta has been manufacturing phenomenal fireworks for centuries, and regularly uses their astonishing shells in various celebrations throughout the year. Currently, there are over thirty-five fireworks factories located within this small island archipelago in the middle of the Mediterranean—all of which are dedicated year-round to the art of pyrotechnics. Although most firework factory workers do this job on a part time basis, a few fireworks factories actually employ fulltime staff. To make a long story short, fireworks are a major part of Malta's historic and religious traditions and they continue to evolve and improve in a variety of complicated, beautiful ways (based primarily on a combination of generational experience and now modern technology). →

The practice of making and using fireworks on Malta dates back to the Order of the Knights of St. John in the mid 1500s AD (this Order also gave the Islands their eight-pointed Maltese Cross). During that time period, fireworks—Malta's magnificent fireworks displays—were only used for very special celebrations such as the appointment of a Grand Master or the selection of a new Pope. They gained an international reputation back then for creating spectacular displays, and now, almost 500 years later, they still have the same well-deserved international reputation.

14th Edition of the Malta International Fireworks Festival

The International Fireworks Festival has become a landmark event on the fireworks-laden Maltese calendar of festivals.



This year marked the 14th edition of this international fireworks spectacular (which began at the end of April, 2015) and commemorated Malta's accession in the European Union on May 1, 2004. Spread over three separate days in 3 separate locations (4/25 in Marsaxlokk, 4/30 in Valletta Grand Harbour and 5/2 in Bugibba), this festival is unique to the islands because it allows both local and foreign fireworks factories to take part and to compete against one another.







This year's festival officially began on Saturday, April 25th, in the fishing village of Marsaxlokk. Three local fireworks factories and two foreign factories took part by showcasing their pyromusical ability. The local fireworks factories representing Malta were: St. Mary Fireworks Factory from Ghaxaq, Lourdes Fireworks Factory from

absolutely incredible, and thousands of people turned out to watch these intricate, beautifully performed, well-choreographed pyromusicals.

The second night of the event, the National Fireworks Competition—April 30th—was held in the Valletta Grand Harbour. The local fireworks factories



Qrendi and St. Andrew's Band Fireworks Factory from Luqa; the foreign factories representing their home countries were: Thailand Fireworks from Thailand (which took part in this festival for the first time ever), and A.P.E. di Parente Romualdo from Italy. As you would expect, the first night of Malta's International Fireworks Festival was

which competed that night were: Lourdes Fireworks Factory from Qrendi, St. Mary Fireworks Complex from Mgarr and Socjeta Piroteknika 15 ta' Awissu from Mosta. It was a very tough competition between the locals, and the evening events concluded with a spectacularly extraordinary display created by Pyro Emotions of Italy



that literally illuminated the entire Valletta Grand Harbour.

The festival closed Saturday, May 2nd, in the little tourist village of Bugibba featuring a pyromusical performed by last year's winner, UK's Pyrotex. The presentation of the awards also took place that same evening, and were handed out by the Hon. Minister Dr. Edward Zammit Lewis in the presence of the MTA Chairman, Dr. Gavin Gulia and MTA CEO, Mr. Paul Bugeja. Trophies were awarded to the winners of the both competitions held the previous two nights, and this year BOTH competitions—the International Pyromusical Competition held in Marsaxlokk on Saturday and the National Fireworks Competition held in Valletta on Thursday—were won by the same company: Lourdes Fireworks Factory of Qrendi. A.P.E di Parente Romualdo of Italy claimed the second prize in the International Pyromusical Competition, followed by St Mary Fireworks Factory of Ghaxaq which came in 3rd. Second prize in the National Fireworks Festival was claimed by 15 ta' Awissu Fireworks Factory of Mosta, followed by St Mary Fireworks Factory of Mgarr in third place.

Even after the third night's competitions had concluded and the trophies had been awarded, the event continued with the ground fireworks displays performed by







seven local fireworks companies: Our Lady of Consolation Fireworks Factory of Gudja, St Mary Fireworks Factory of Qrendi, St Mary Fireworks Factory of Mqabba, St Catherine

Fireworks Factory of Zurrieq, St Mary Fireworks Factory of Ghaxaq, St Andrew's Fireworks Factory Socjeta Filarmonika L-Unjoni of Luqa, and St Michael Fireworks Factory of Lija.

Yes, the Maltese Islands are renowned for their love of fireworks, and they proved their phenomenal pyrotechnic ability once again with this spectacular secular festival. Fireworks definitely form an important core of almost any Maltese celebration here, but it is critically important to remember that most of their annual fireworks festivals are grounded and intermixed with their deeply held religious beliefs. From here on out (almost every weekend) their fireworks festivals will honor religious icons and every display will be mired in tradition.

I was fortunate enough to get to take photographs for the 2nd time during this year's events in Malta. If you are interested, you can see more of my photography on my Facebook page: keithbuhagiartphotography [WEBlink](#). I will be adding many more photographs to this page as the festival season progresses. ■





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**pyrotechnic
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FOR FIREWORK COMPANIES & ENTHUSIASTS ACROSS THE WORLD



**A HISTORY OF
Plásticos
Gamón**
Plásticos Gamón, first pyrotechnic-oriented magazine in the world, has been publishing since 1984. It is now the most important magazine in the field of fireworks, with a focus on the history and evolution of the industry.

**Japanese
Hanabi**
The Japanese Hanabi festival is one of the most spectacular fireworks displays in the world. It is a tradition that has been passed down for centuries, and it is a great way to experience the beauty and power of fireworks.

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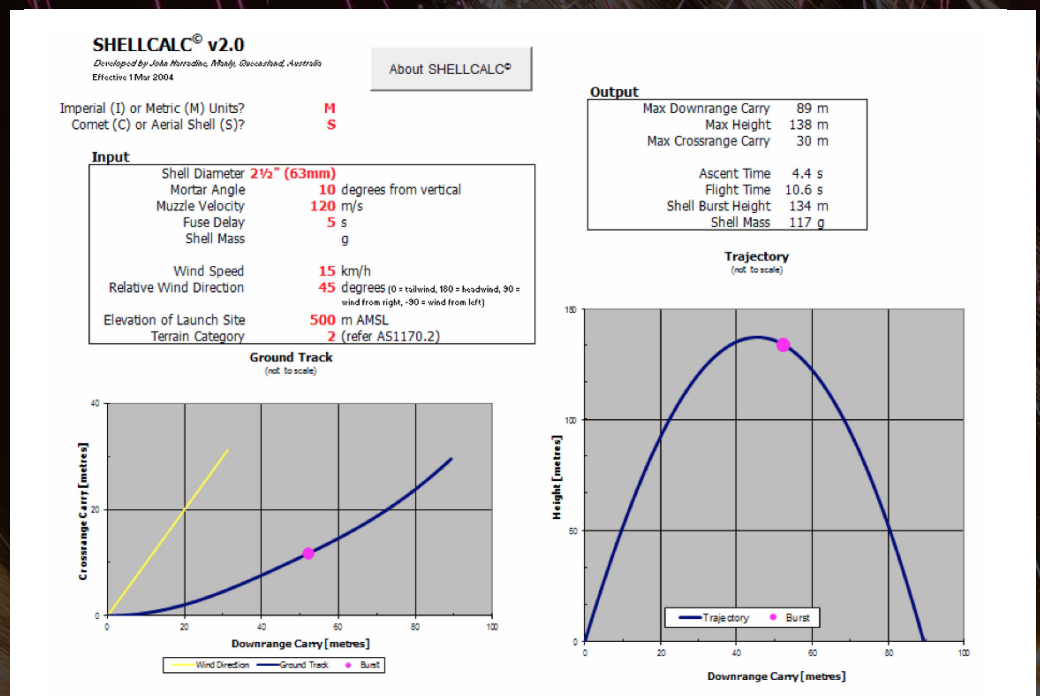
ShellCalc® Pro

A tool for modeling trajectories and debris

Written by Dr. Tom Smith

Simply put, firework displays are not risk free. Because of this inescapable fact, it is vital that the risks are accurately and carefully assessed and managed to be as low as possible. To do so, assessments must be made using data regarding the conditions that may occur when the display will be fired.

The process of managing the risks involves all parties: the event organizer, the event producer, the enforcing authorities and the firework contractor. In addition, it requires a sound comprehension of the various risks involved. In general, the show must be designed to maximize the potential for



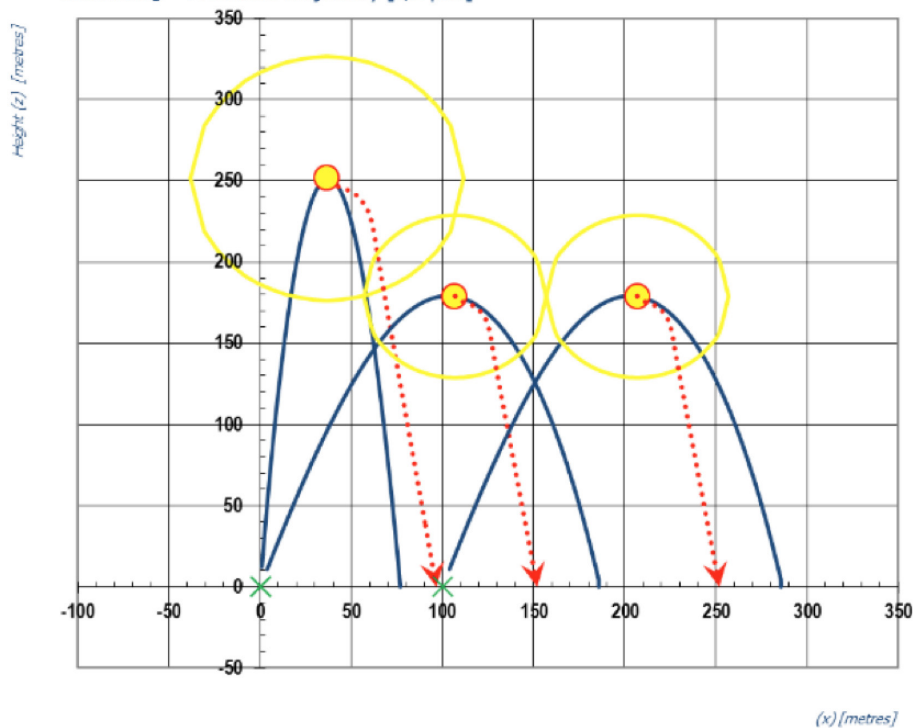
firing under a variety of "most likely" and "worst case" scenarios. Careful consideration must also be given to what is achievable under a variety of meteorological conditions. For example, the weather on the night of the display – especially in November or on New Year's

Eve – is unlikely to be the same as the weather during the pre-event site visits.

ShellCalc® is one tool that can immensely help increase an understanding of the risks involved during this process. ShellCalc® is a sophisticated trajectory and fallout modeling program designed to run using

The following plots illustrate some of the program's important features and uses:

ShellCalc© - Predicted Trajectory [x/z plot]



Trajectory plot

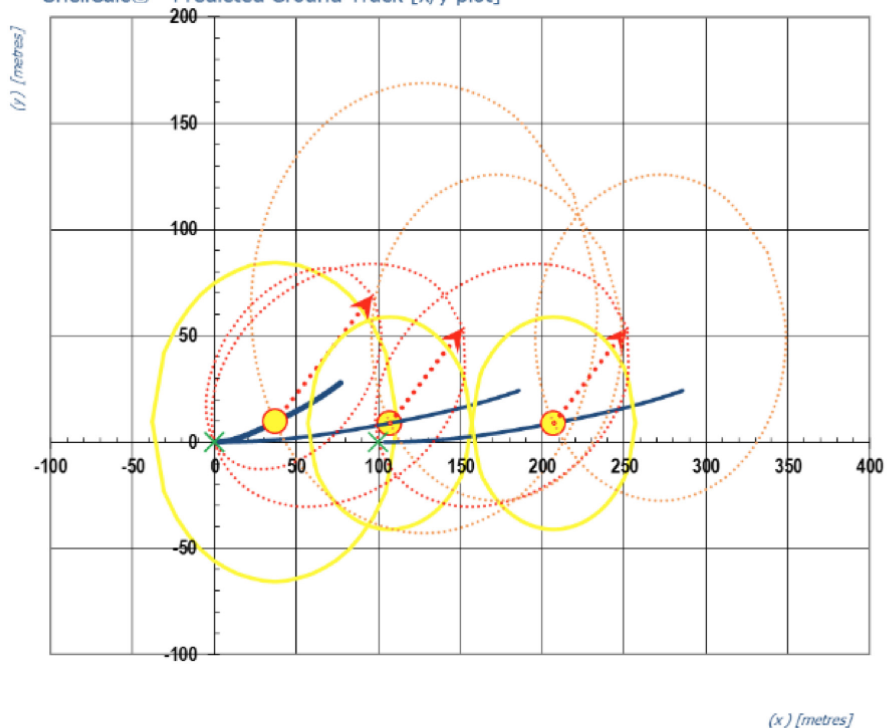
This plot shows the burst diameters and "normal" fallout from 3 shells

This plot shows data for the following:

150mm shell fired vertically
 100mm shell fired at 15°
 100mm shell fired at 15° but offset by 100m
 Force 4 – 45° wind angle

Note: long burn arrows are not shown.

ShellCalc© - Predicted Ground Track [x/y plot]

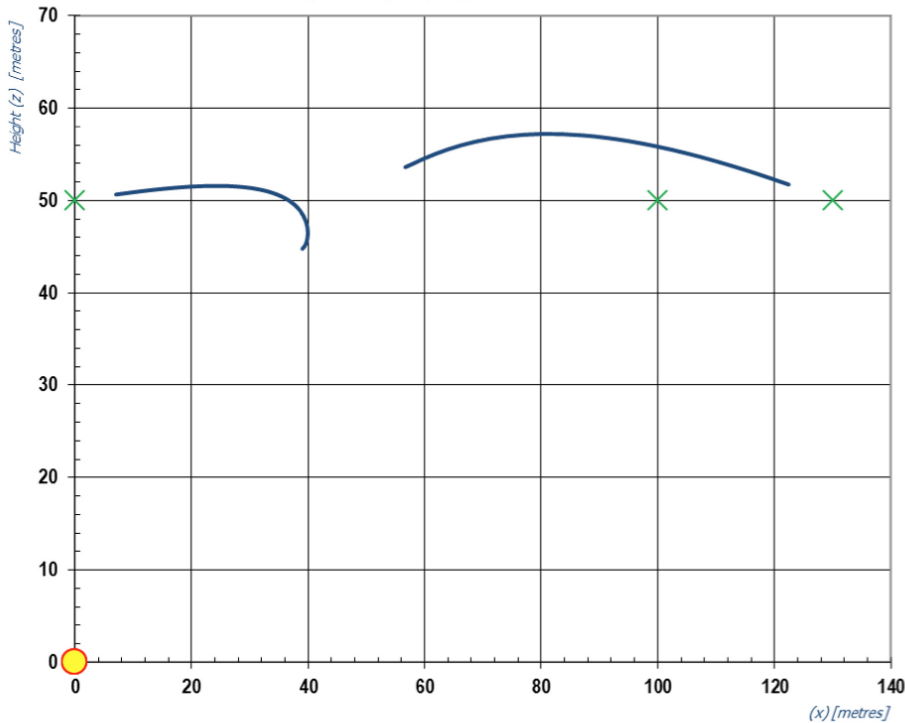


Ground Track

This shows the same situation as above only with "Long Burn" debris circles shown.

This plot is ideal for superimposing on maps or aerial photographs within the program

ShellCalc© - Predicted Trajectory [x/z plot]



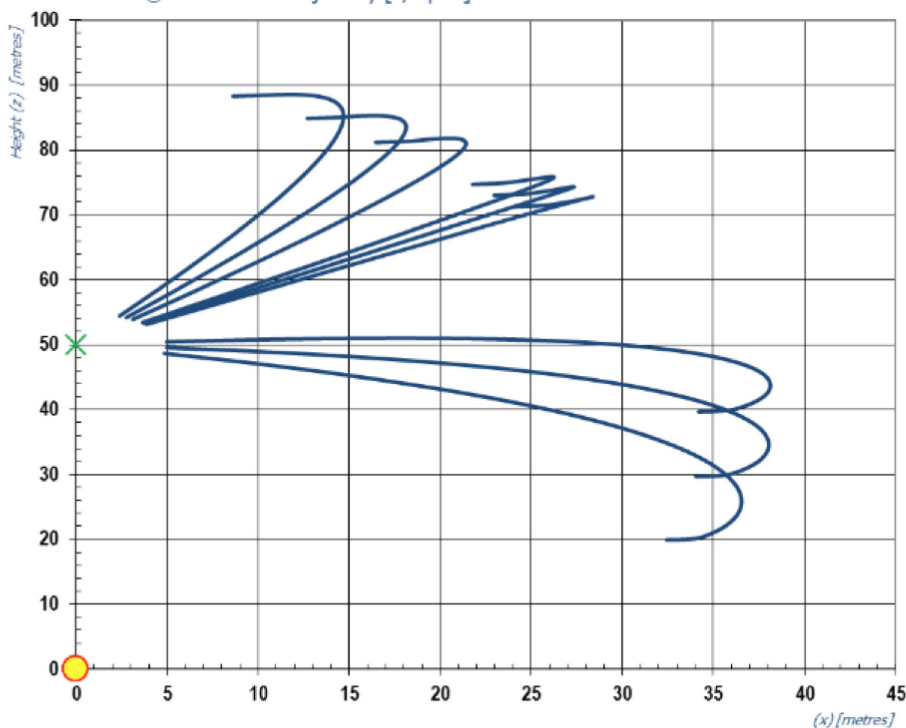
2 position firing comet plot

This trajectory plot shows:

2 x 30mm comets with 2 sec flight time
Fired 130m apart at 80° from vertical
firing angle
Force 4 wind and 180° relative wind
angle (i.e., from right to left)

This is useful for modeling, for instance,
comets fired from a stadium roof

ShellCalc© - Predicted Trajectory [x/z plot]



Mines firing off structures

This trajectory plot shows 3 types of mines
fired 50m above ground and fired at 30°,
45° and 90° from a vertical position (note
mines are different calibers and spreads)

Mines (and Gerbs) are modeled
independently as 3 separate projectiles to
allow for wind effects to be modeled (for
instance with long burn effects)

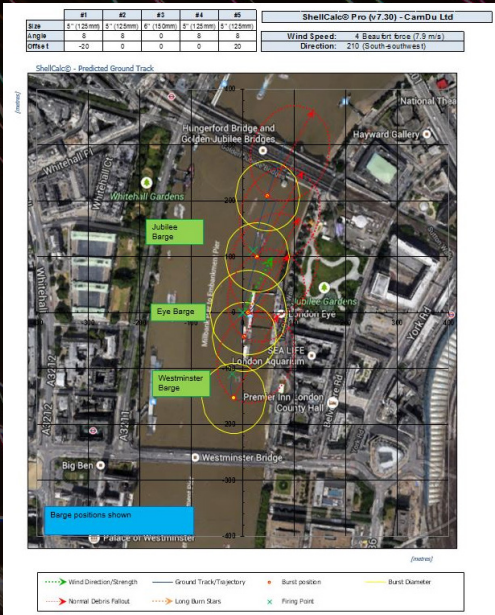
ShellCalc® Pro now allows users to incorporate maps or aerial images into the program itself. This allows the user to immediately visualize the debris and/or fallout as the input parameters change. This new version of the program was recently used to prepare contingency plans and for selective removal of fireworks from London New Year's Eve show in 2014. Debris effects were modeled using 8 different wind directions, each with 4 different wind speeds in order to adequately reflect all of the possible variations that could impact on the display.

ShellCalc® Pro is regularly and continually being updated and refined to incorporate new and useful features. User feedback is

always welcome either directly or during one of our ShellCalc® training workshops (visit www.pyroworkshops.com [WEBlink](#) to see the current workshop schedule).

Our ShellCalc® Standard program is not being upgraded or modified any further, but will it remain free and downloadable to the general public.

ShellCalc® is now being used by some of the largest display companies in the World, and at some of the world's largest events. This makes it possible for pyrotechnicians to make better informed choices when it comes to their selection of product to be fired, and gives them a greater ability to meet site goals regarding product risk assessments. Furthermore, this makes it



possible to produce practical contingency plans for the curtailment or cancellation of displays that reach an unacceptable risk level. It is important to note that ShellCalc® is not a show simulation program, but it can certainly be used simultaneously with such programs, especially if the choreographer has in-depth knowledge of the firing site and the products to be used. Used together, this can thoroughly manage the risks of firework displays, and will allow creative and spectacular displays to continue to be fired under a variety of conditions.

For more information and examples, and a short BBC documentary on the planning of the 2014 London New Year display (using of ShellCalc® Pro) please visit the following sites or contact me directly:
www.shellcalc.co.uk [WEBlink](#)
facebook.com/shellcalc [WEBlink](#)

Dr. Tom Smith is chairman of the CBI Pyrotechnic Group (www.eig.org.uk [WEBlink](#)) and Secretary of the British Pyrotechnists Association (www.pyro.org.uk [WEBlink](#)). Tom is the Managing Director of CamDu Limited (www.camdu.com [WEBlink](#)), an independent explosives consultancy, and has worked on some of the most major firework displays around the world. He is also the author of a recent textbook – Firework Displays: Explosive Entertainment (www.fd-ee.com [WEBlink](#)).

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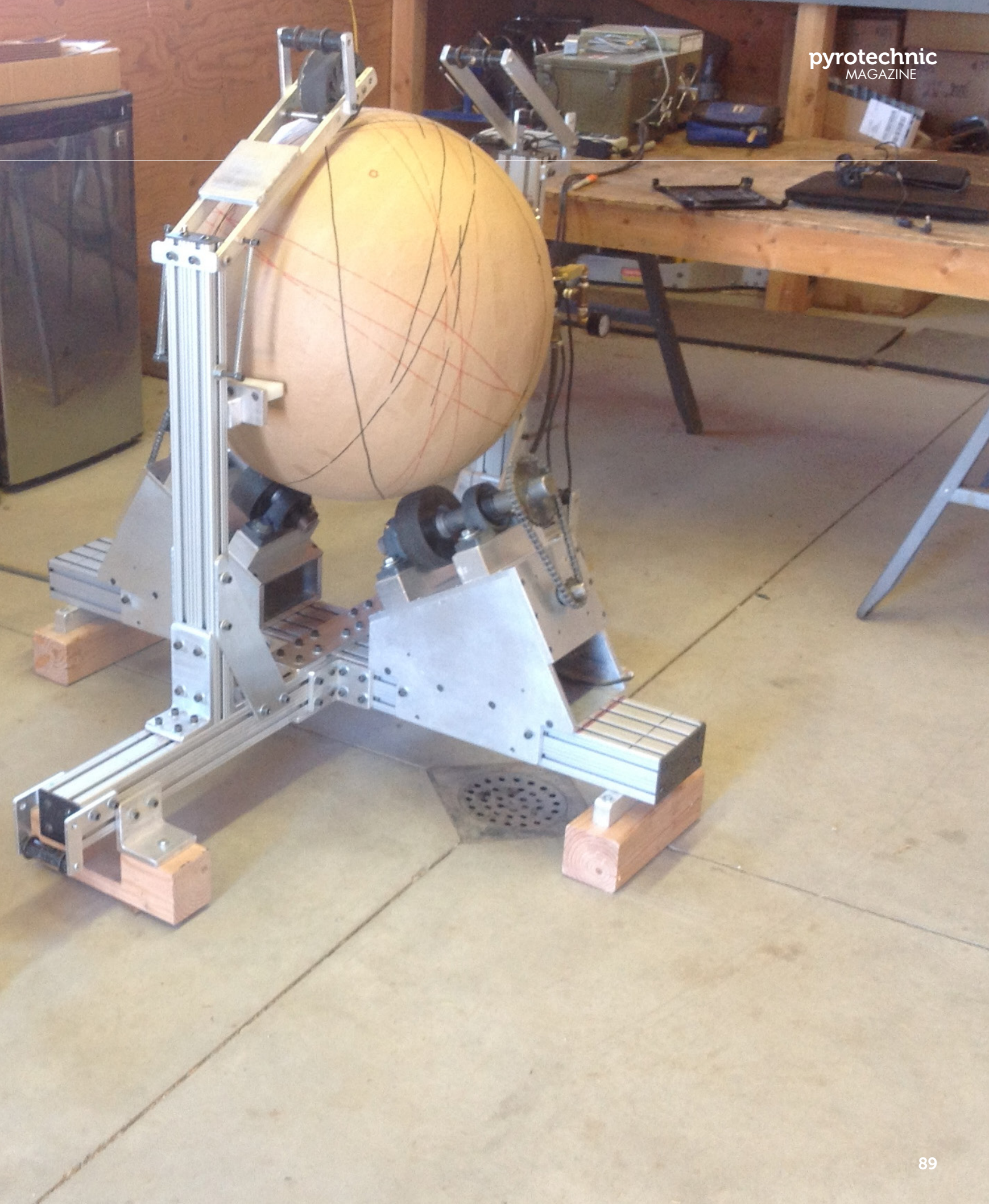
WIDMANN'S WAY:

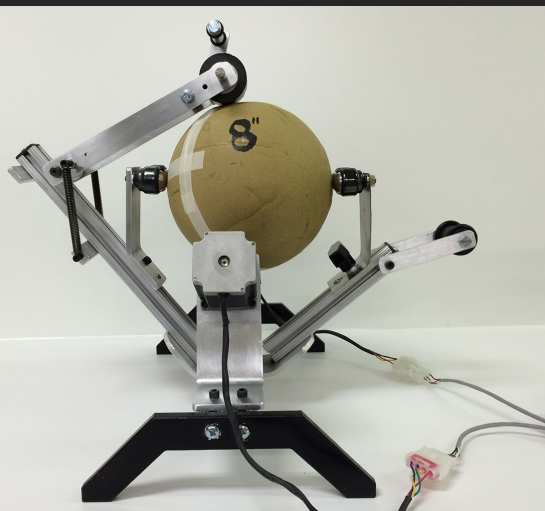
SLEEK, FAST & ELEGANTLY DESIGNED

Written by Michael Richards

I realize that the word genius is frequently overused in today's highly inventive world, but in this case it is entirely apropos. And honestly, if you ever met Jim Widmann, you'd quickly ascertain he is a very humble guy who would probably blush to hear himself described this way. But the WASP machine he invented is assuredly ingenious, to say the least, and truth be told, he essentially single-handedly solved an extraordinarily time-consuming problem that plagued shell-making pyrotechnicians for decades. Surprisingly enough, it has been more than 21 years since he invented the first WASP machine, and since then, his company—Connecticut Pyrotechnic Manufacturing (www.ctpyro.com **WEblink**)—has sold well over 400 of the machines to companies and individuals in 27 different countries worldwide. →







For those of you who don't know, "WASP" is an acronym for "Widmann's Automatic Shell Pasting," and those four simple letters describe the function of the machine quite precisely. The WASP machine automates the most arduous task involved in shell making—pasting the outside of the shells. Widmann's machine saves literally dozens of hours of hard work (especially when creating larger shells) and even makes the shells more aerodynamically sound since they are more uniformly pasted.

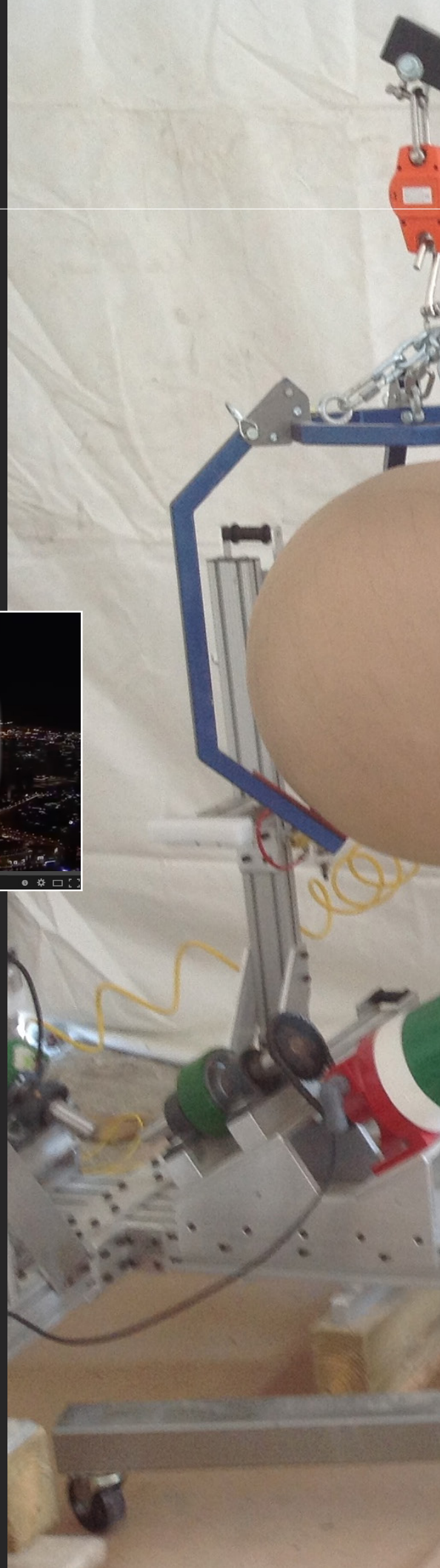
The WASP accomplishes this feat using a computer to control its stepper motors, guide wheels and a gummed tape delivery system. "It takes 200 separate commands from the computer for the stepper motors to make just one revolution," Jim says. "What I realized when I first designed the machine was that a continuous roll of gum tape needed to be applied in a uniform fashion to make this work properly."

Much has changed as his WASP machines have evolved over time (especially the software, which he has made much more user-friendly). His original WASPs were made out of wood and weighed over 250lbs. Gradually, he whittled that monster down to its essential elements, created a lighter—yet much stronger—aluminum frame, and increased the maximum shell size the machines could paste. As an

example, recently, Jim flew to Dubai to help Phil Grucci in his attempt to set a new world record on New Year's Eve. His part in all of this (using his very own WASP machines he brought along with him) was to build fourteen 24" shells, an integral part of the show. Remember, for smaller shells the WASP makes the process about 7X faster; for larger shells—like the 24" shells Jim made for Grucci, the process was 100X faster! Needless to say, the shells were phenomenal, and a new Guinness World Record for the world's "Largest Fireworks Display" was set that night, see below.



Besides the machinery and aluminum frame, the true key to the WASP resides in the amazing software that's included. Ironically, that is also what keeps his remarkable invention from being easily copied or reproduced. Complex proprietary algorithms are used to control the stepper motors properly, and even though the machine is made of parts that can be mimicked or mechanically copied, it is the software that provides the important precision and finesse. You have to understand (and if you've ever hand-pasted a shell, you do) a 12" shell can take upwards of 3 hours to paste by hand. With a WASP machine, it takes about 9 minutes. Smaller shells—like the more common 5" or 6" shells—can take as little as 55 seconds! Obviously, this amazing invention has made an incredible difference in the number of shells produced at PGI events. Actually, it has →

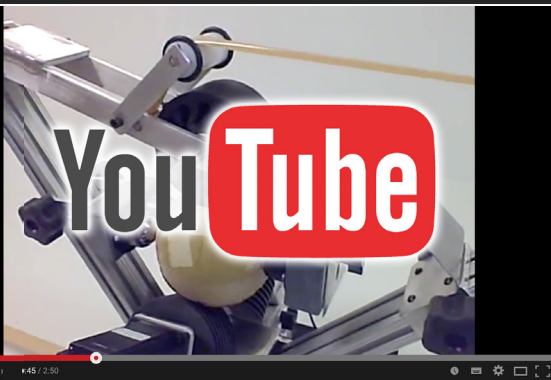






made an amazing difference in the number of shells created in the US, period.

The current model (the last one I personally had my hands on was the WASP5) is now called the WASP Superstinger. Just like its predecessor, it can easily and effortlessly paste 2" through 12" shells while connected to a simple laptop or desktop PC. And forget the technical aspects for a minute, the WASP is actually a lot fun just to watch! In just a few minutes time the machine applies the continuous strip of gummed paper to the spherical shells. It not only pastes them perfectly, but it burnishes them as well, see below.



Here are the basic advantages of the WASP as noted on The WASP's homepage:

Advantages of using a WASP machine:

- Paste shells all day long without fatigue
- 7 times faster than traditional hand techniques
- Exactly the same paste job, every time
- Completely automatic, stops by itself when program is done
- Burnish mode provides a smooth, finished appearance
- Easily adjusts to all your shell pasting needs
- Requires only AC power and your computer

Not one to rest on his laurels, there are a couple of new and exciting developments on the horizon for

Connecticut Pyrotechnic. First and foremost, is the release of the new WASP Hornet. The Hornet is a slightly smaller/lighter entry-level machine designed to paste 2" through 8" shells. Retailing for just \$1,050 (976 Euros), this new model runs \$700 less than the Superstinger (which retails for \$1,750/1627 Euros) and should be a real hit with both amateurs and professionals alike. In addition, this machine (just like the Superstinger) can be outfitted to handle either 110 or 220 volts.

Also in the works—and this represents a complete diversification for Jim's company—is his recent importation and sale of a relatively unknown chemical in the U.S. called "phenolic resin." This is another amazing timesaving idea from the man who brought you the mother of all amazing timesaving ideas. Technically, phenolic resin is a heat-cured, thermosetting, high-strength, synthetic resin. It has a wide variety of uses, and sometimes it is even used as a pyrotechnic fuel as well as a chemical binder. (As I did research for this article, I found that phenolic resin was once used as a chemical binder for the fuel they put into the Space Shuttle). Complex chemistry aside, from Jim's perspective, the most important quality of phenolic resin has to do with its drying capability. What does this mean? Well, the little balls used to create 8" comets generally take about a month to completely dry. Using phenolic resin, they can dry overnight! Yes, overnight! This substance essentially replaces air milled Red Gum (you know, that Australian ant excretion we're currently running out of) used as binder and fuel in many fireworks formulas. Even though many Americans haven't heard of this chemical yet, the Chinese are already using it extensively. And Jim's company has already ordered 2½ metric tons of the stuff! This fall, Jim will be presenting a paper at the ISF



(International Symposium on Fireworks) in Bordeaux, France (www.isfireworks.com **WEblink**) about mixing hexadene and phenolic resin as a binder for large comets. If you're interested in purchasing this chemical from Connecticut Pyrotechnic, he is currently selling the substance for \$5.00 per pound plus shipping. It generally makes up about 5-6% of the chemicals you add to any composite, so you just have to figure it will take about 6 lbs. of phenolic resin for every 100lbs comet material you make (email Jim for specifics: widpyro@charter.net). This is certainly a game-changer for U.S. pyrotechnics, and will make it possible—for the very first time—to make large shells onsite instead of having to transport them.

"What America used to bring to the table," Jim said reflectively toward the end of our interview, "was the ability to look forward and always make the next greatest thing. I'm trying to get us to the forefront again, at least in the shell making business." With that in mind, Jim introduced his new WASP machines into China's huge fireworks market; he even has his name listed—as an American—on a Chinese patent. In conclusion, I think 2015 is going to be a big year for Connecticut Pyrotechnic. And with Jim's superior WASP computer technology, his Superstinger and new Hornet inventions, and his incredible phenolic resin idea, I think it we'll be hearing a great deal about Jim Wedmann throughout 2015. ■



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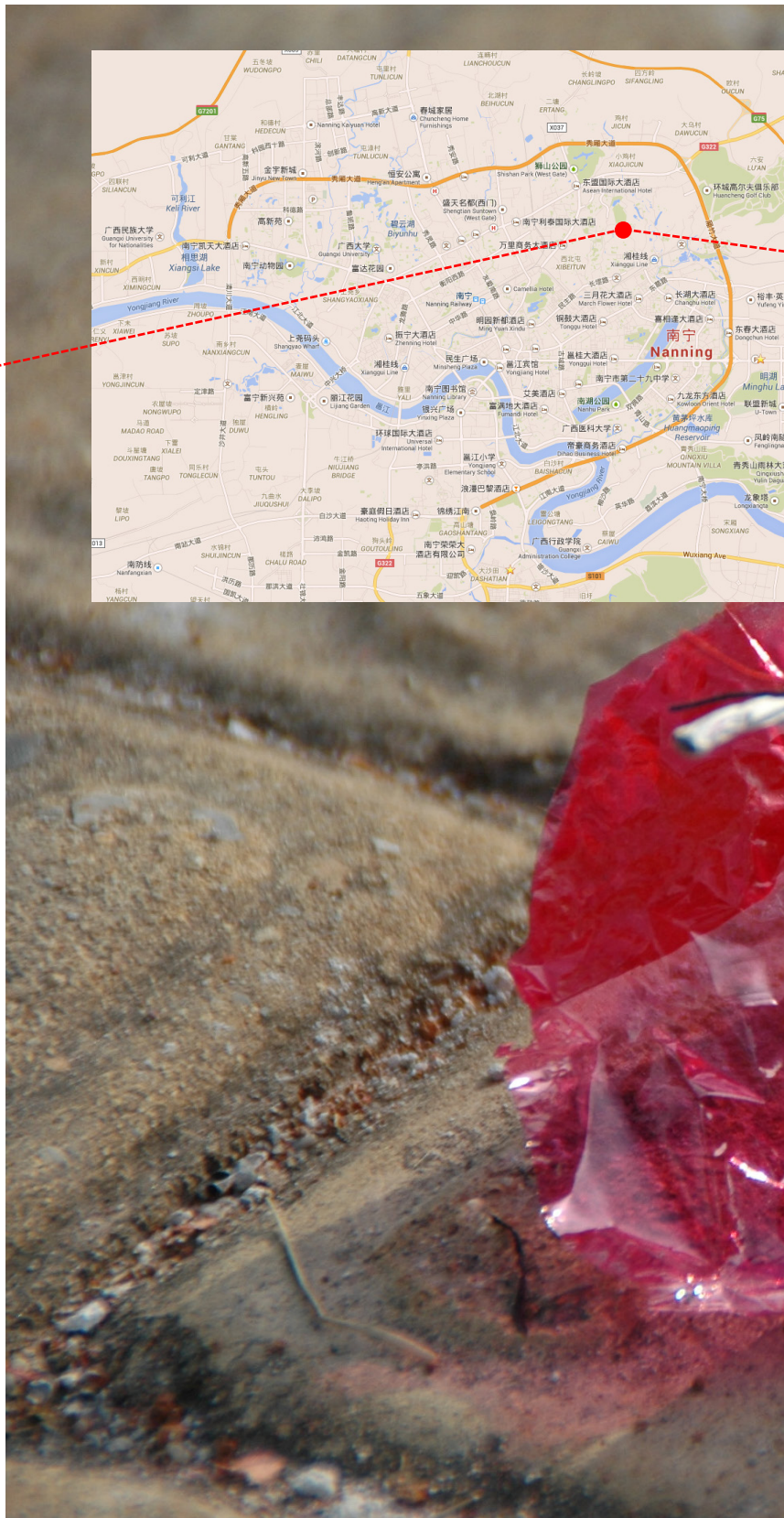
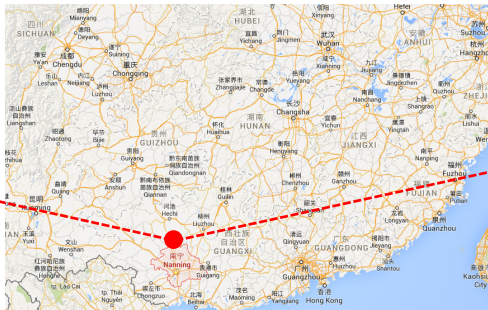
CHINESE NEW YEAR 2015

Written by Tony Gemmink

**Photos by Conrad van Renesse, Hans Pontes, Frank Roozendaal,
Elmar Wenneker and Thomas Grimbergen**

Back in 2012, after we returned from our very first trip to China, we promised ourselves to return to Nanning again by 2015 to celebrate Chinese New Year. You see, we enjoyed our first trip so much, and we had such an amazing time, we simply had to go back. Great food, great people and over 80 shopping tents all around our hotel where you could buy almost anything your heart could desire. →





CHINESE NEW YEAR 2015

SO, IN 2014, AS THE YEAR OF THE GOAT RAPIDLY APPROACHED, WE EXCITEDLY PLANNED OUR RETURN TRIP TO NANNING—6 OF US: 3 VETERAN TRAVELERS AND 3 CHINA NEWBIES. Actually, the fun seemed to begin weeks before our departure as we relived our first trip time and time again in the retelling. Finally, the 16th of February arrived, and we took our 11-hour flight from Amsterdam to Shanghai, and then another two-hour trek to Nanning. →





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It was early afternoon when we arrived in town, so we decided we had plenty of time to shop and light firecrackers before we had to do check-in at our hotel. That wasn't going to happen, however. Much to our surprise, there were no shops along the roadside selling fireworks, and there wasn't a single solitary tent set up outside our hotel. In just three short years, everything had changed here. Even the new shopping mall that had been built in 2012 was now closed and being remodeled. Also, the wonderful Cantonese restaurants where we had gorged ourselves on Cantonese food during our last trip, they were all gone as well. Horrendously disappointed, we registered at our hotel and then made a one-hour journey to a new shopping mall that had opened since our last trip, and

during dinner we asked our waitress (who only a bit English) where we could buy fireworks. It took her about 30 minutes to find out, but she finally brought us a note we could give to a taxi driver with directions to a small market nearby that most assuredly sold fireworks. A little leery of the clandestine feel of all of this, we decided to go where we had been directed anyway, and were taken to a small market that had one string of firecrackers for sale. Yes, one string. Almost laughing, we bought them. And then we bought a few more fireworks from the same guy who sold us the firecrackers because he had a few stashed in his backyard. Not exactly like our last trip. Were we really in China, the birthplace of pyrotechnics?

When we did light the fireworks we had purchased, there was something distinctively different about them: the smell was not what we were used to. This must be the way real fireworks are supposed to smell before all of the U.S. and European restrictions are applied. We definitely liked this old smell better. It was kind of intoxicating.

A little happier now, having lit a few fuses, we were still dumbfounded by the lack of product available and the lack of variety being sold. This was Nanning, after all. When we returned to our hotel, →





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we showed a newspaper article to several of the employees there about the abundance of fireworks in their city. They told us about a shopping square fairly near the hotel that had the requisite red tents that sold fireworks (tents that sell fireworks in Nanning are always red). After a brisk 30-minute walk in unusually high humidity

point, too, because this handful of tents made the entire trip feel completely worthwhile.

Fully laden now with small novelties, strings of firecrackers and small thunders, etc., we headed off to find a good location to light a few fuses. And we had a great time firing everything we had bought, until a very serious-looking guard showed up and began talking to us rapidly in Chinese (which of course, none of us understood). We thought we had chosen the perfect spot in an area that wouldn't bother anyone, but China is a country of many rules and we obviously had made a mistake.

Therefore, we crossed the street to another area and fired a few more newly purchased fireworks. This location must have been OK because the guard didn't follow us anymore and he appeared uninterested. Then we made a couple of really fun purchases: two large rolls of firecrackers approximately 65 ft. and 95 ft. long (20 and 30 meters)! But as we carefully unrolled them near a bridge and prepared to set them off, the guard's interest quickly piqued again, and even others in the area this time seemed equally upset. But we lit the fuses anyway before anyone could stop →



and warm temperatures, we found the red tents we'd been looking for. Finally, we had found the fireworks we had been looking for since our plane had touched down in China.

The tents turned out to be our dream come true, replete with a wide variety of product to peruse and to purchase. This was the reason we had traveled 13 hours to get here. I guess we were easy to please at this







us, and then made a quick escape after the noise died down so no one could reprimand us in Chinese. Later that day, we found out that the problem was that we set them off too close to a bridge (strictly forbidden) and that was why everyone appeared upset.

In spite of our rule violations during the day, Chinese New Year's Eve had finally arrived and we were anxious to buy more fireworks to fire during the evening festivities. So, back to the red tents again where this time others had already gathered to buy and fire their celebratory fireworks as well (and even set them off on the bridge which we now knew was against the rules). By early evening, fireworks were lighting up the skyline almost everywhere, and we enjoyed the color, sound and smell until around 2:00 AM.

But alas, just like in so many other countries around the world, the rules have changed for fireworks production in China (at least in regards to what consumers can

buy). No longer can you buy shells bigger than 1.5" to 1.75", and no longer can you buy cakes any larger caliber than 30mm (1.18"). On our last trip in 2012, we bought 10" shells and 100-shot cakes that were 2.5" and even cakes with 75mm shells! Well, those days are definitely over.

Although the rule change did tarnish our enjoyment somewhat (we had longed to fire large caliber shells like we had 3 years earlier) it was still amazing to actually BE in China celebrating the New Year with them. Happy 4,712, by the way!

And don't think we didn't continue to celebrate! We kept on firing fireworks for the remainder of our trip. In fact, we fired so many that two amazing things happened: one, we finally reached a point of being pyrotechnically satiated (that in itself was amazing), and two, the owner of the property we were using to light fireworks told the guard (who was still following us around) to leave us alone.

Nanning turned out to be the perfect choice for our Chinese New Year's celebration for a number of important reasons. Since Nanning is a relatively wealthy city, it is very clean, has nicely paved, modern streets and very nice hotels. We especially enjoyed the Marriot in Nanning, and can wholeheartedly recommend the restaurants there. Of course, fireworks in Nanning were probably a little more expensive than in the countryside (a 100-shot, 1.3G cake costs between \$60-\$100/55-91 Euros), but after New Year's, you're free to haggle and get lower prices. In short, don't expect Luyang prices there! The truism now almost everywhere is that fireworks are no longer cheap in China. But Nanning is beautiful place during New Year's celebration (generally a comfortable 20-25°C/68-75°F) while Beijing is smoggy, crowded and cold. Between the two, we were very happy to have had our pyrotechnic vacation in Nanning. We had a wonderful trip. ■





Thanks to Thomas, Conrad, Elmar, Frank and Hans for a great week of fireworks!



类别：组合烟花 净重：1/1 总重：1000g
最大单发重量：≤15g 保质期：三年
执行标准：GB1031-2014 执行标准：GB1031-2014

产品名称：欢乐雷 产品类型：组合烟花 含量：1/1 总重：1000g
产品规格：C级 规格：32 SX25X34.5cm 最大单发重量：≤15g 保质期：三年
数量：1 生产日期：见合格证 执行标准：GB1031-2014 执行标准：GB1031-2014

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